



GROUP OF ANTIS (PERUVIAN CAMPOS).

THE
EARTH AND ITS INHABITANTS.

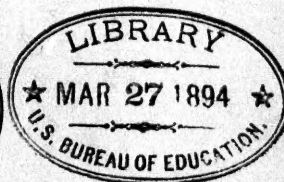
SOUTH AMERICA.

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BY
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VOL. I.
THE ANDES REGIONS.

Science



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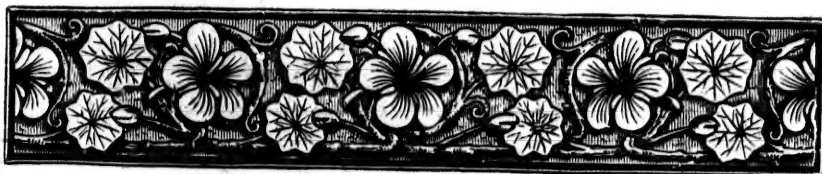
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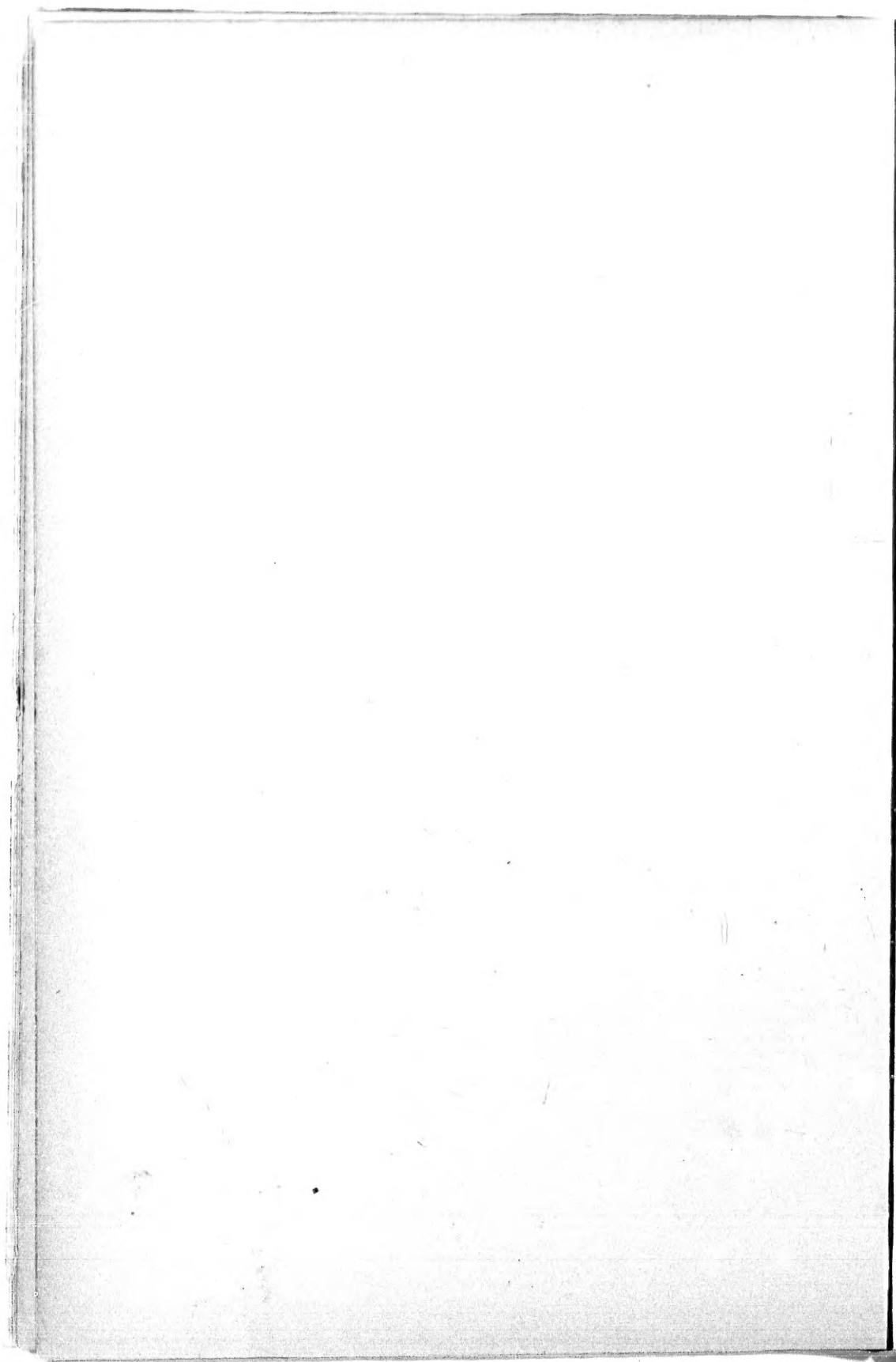
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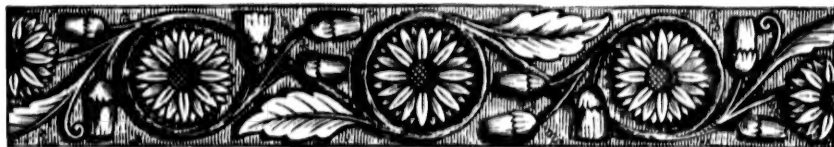
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THE EARTH AND ITS INHABITANTS.

SOUTH AMERICA—THE ANDES REGIONS.

CHAPTER I.

GENERAL SURVEY OF THE CONTINENT.

I.



BIRD'S-EYE view of South America shows that it forms the eastern termination of the continental lands describing a vast semicircle round the Pacific basin. This section of the oceanic periphery presents far greater regularity in its orographic development than any other region of the globe. Neither in Africa, in Asia, nor in North America do the mountain ranges and masses skirting the ocean at varying distances display such an unbroken line of uplands, nor do they preserve more strictly the aspect of coast ranges.

The Andes differ also from all other continental systems, such as the Alps, Himalayas, and Rocky Mountains, in their far greater relative importance to the respective regions above which they rise. The mean altitude of South America, regarded as a solid mass with perfectly horizontal surface, was estimated by Humboldt at 1,150 feet. But according to later and more accurate researches based on more detailed cartographic documents, the continental altitude should be raised to 1,312 feet, of which about 820 feet should be assigned to the mass of the Andes system in an equal distribution over all the land standing above sea-level.

CONFIGURATION OF THE CONTINENT.

The form of South America, as compared with that of the other continents, is one of those topics that have been most frequently discussed by geographers. The analogy presented by the contour-lines of the southern section of the New World with those of Africa and Australia had already been noticed by Buffon and other

observers in the last century. Favourite subjects of comment have been the contrasts offered by the three continental regions of the southern hemisphere to those of the north, not only in their more massive outlines, less indented by marine inlets, less diversified by great peninsulas, but also in other salient physical features, as well as in their respective geographical positions. Attention has likewise been called to the harmonious correspondence in the general disposition of Africa and South America, their great fluvial basins facing each other, their most advanced headlands of Upper Guinea and Brazil projecting from either side of the Atlantic as if to meet in mid-ocean.

Nor have physical geographers failed to notice the resemblance in the contour-lines of the two main sections of the New World itself, both of triangular form, with apex pointing southwards, and with orographic and hydrographic systems presenting many features in common. Here the chief contrasts between the northern and southern divisions are, in fact, mainly due to the differences of latitude, compared with which the diversities of outline are of relatively slight importance. Such diversities, however, require to be carefully noted. South America, with far more clearly marked periphery, is sharply limited in the north-west by the fluvial valley of the Atrato, which is connected by a very low pass with the marshy gulf of San Juan. Thus the continent, taken as a whole, may be regarded as a vast insular region somewhat analogous to Australia.

Far more irregular in its broad outlines is the North American continent, which tapers southwards through the long sinuous stem of Central America forming a prolongation of the Mexican uplands. At its opposite extremity the northern coastlands are intermingled with a labyrinth of large islands and archipelagoes, clothed for the greater part of the year with a snowy mantle, and soldered together by a continuous icecap. In this direction the dimensions of the North American seaboard can scarcely be accurately determined, the extremely vague estimates of its actual extent depending on summary and in part contradictory surveys. In fact, the northern regions are merged, so to say, in the mysterious waters of the Arctic seas. Hence the northern division of the New World, although occupying a larger superficial area, is inferior to the southern continent in the extent of its habitable lands. Not more than two-thirds of its surface is really at the service of civilised man.

THE SEABOARD.

Till recently all geographers, in common with Carl Ritter, pointed to the more diversified character of its coast-lines as a great advantage enjoyed by the northern over the southern continent. One-half of its seaboard abounds in islands and peninsulas, such as the Polar Archipelago, the Aleutian group, the West Indies, California, Florida, and Central America, whereas the southern continent presents a scarcely indented coast-line, with but few and small peninsulas, unless the Patagonian extremity itself may be considered as a sort of peninsular region. The islands, nowhere numerous except on the austral coasts, are disposed close to the mainland, so as to scarcely disturb the general uniformity of the shore-lines.

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ATURES RAPIDS, ORINOCO; VIEW TAKEN AT THE CERRO PERRIQUITO.

Nevertheless, this difference in the relative proportion of indentations and archipelagoes fringing the two continents does not possess the importance which has been claimed for it. An abundance of islands and peninsulas does not necessarily constitute an advantage in itself, and may even be a drawback. Everything, in fact, depends on the special conditions presented by each of the geographical divisions. Thus the West Indies have become the "Jewel of the New World," thanks to their happy position at the confluence of the oceanic currents and in the forefront of the Caribbean Sea; thanks also to their climate, to their natural resources, and to the facilities of communication from port to port.

But the snowy lands of the Far North, washed by the Frozen Ocean, remain absolutely uninhabitable; nor is it likely that they can ever attract any settlers. They may at most continue to be visited by seekers for gold and peltries, or by a few travellers anxious to study nature under its sternest aspects of dreariness and desolation. On the other hand, the North American peninsulas, such as Nova Scotia, South California, and even Florida, are far from possessing the same economic value for intending immigrants as the mainland itself.

RIVER SYSTEMS.

But in both continental divisions the marine inlets, offering points of easy access to navigation, are increased ten or even a hundred fold by the network of fluvial or lacustrine arteries ramifying throughout the interior. In this respect the twin continents are equally favoured in comparison with the various sections of the Old World. South America certainly lacks the vast fresh-water basins characteristic of the North; even Titicaca, its largest lake, although traversed by small vessels, is an isolated basin in an upland depression of the Andes, unconnected with any other lines of communication by water. But to the ramifying system of the Mississippi, with its 17,000 or 18,000 miles of navigable highways, South America may oppose the Amazons, largest river on the surface of the globe, with a development of deep channels at least twice as extensive as that of the Mississippi basin.

To this vast network of inland waterways must be added the Orinoco basin, which also abounds in navigable streams, and the River Plate system, which includes the Paraguay, Parana, and Uruguay, and which rivals the Mississippi itself in the extent of its convergent watercourses. Moreover, South America is distinguished amongst all the continents by the absence of clear parting-lines between its great fluvial basins. To a certain extent all the hydrographic systems from the Orinoco delta to the La Plata estuary may be said to be merged in a single fluvial basin.

So far as regards the Orinoco and the Amazons, the union is complete, thanks to the ramifying waters of the upper Orinoco, which are discharged in one direction southwards through the Cassiquiare, and in another straight to the Atlantic and the Gulf of Paria, forcing their way at the Maipures and Atures rapids over the rocky remains of eroded mountain barriers.

Although between the Amazons and La Plata basins the communications are

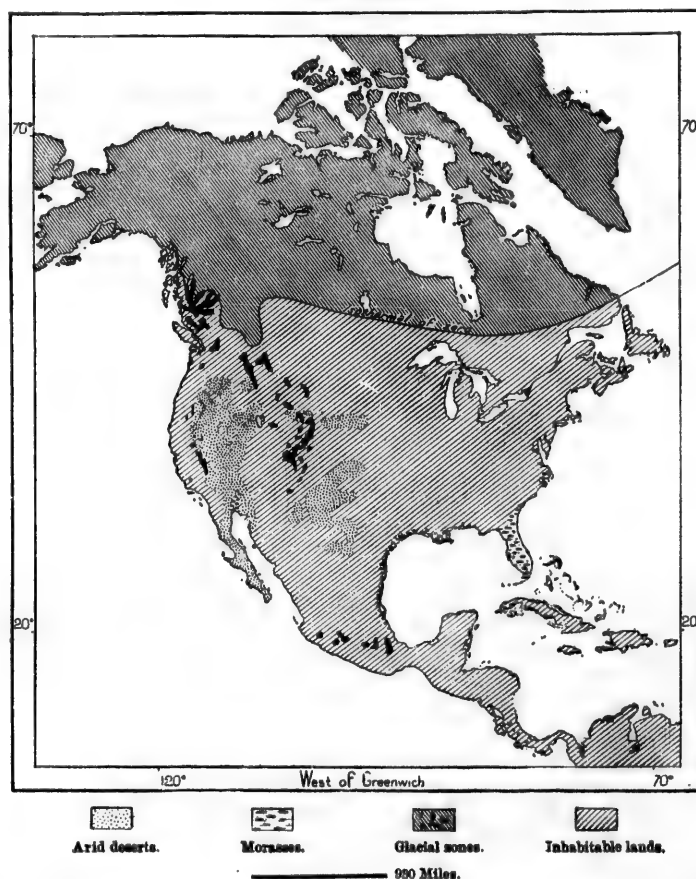
ATURES RAPIDS, ORINOCO; VIEW TAKEN AT THE CERRO FERRIQUITO.



more obstructed, the water-parting presents at various points certain tracts of undecided slope, where the spring or swamp waters flow now in one direction, now in another, according to the set of the winds, the abundance of local rains, the alluvial deposits, or the effects of landslips. At the foot of the Bolivian Andes the various branches of the Mamoré and Pilcomayo seem interlaced, and lower down the level plains are dotted over with marshy tracts, whose

Fig. 1.—INHABITABLE REGIONS IN NORTH AMERICA.

Scale 1 : 70,000,000.



sluggish waters drain to both basins. In the heart of the continent the upper affluents of the Guaporé and the Jaurú are merged together during the rainy season. The Rio Alegre, a tributary of the Amazons, has its source on the southern slope of the continent, and traverses a marshy parting-line before sweeping round the Serra Agoapehy range of hills on its northern course to the Guaporé. Nothing would be easier than to establish a permanent connection

between the two fluvial systems, either by a series of portages, or by cutting a canal four or five miles long across the divide. Other interminglings of river basins have also been developed farther east between the eastern affluents of the Paraguay and the Arinos, a main branch of the Amazonian Tapajoz, and attempts to connect them by cuttings were made in the years 1713 and 1845.

Fig. 2.—INHABITABLE REGIONS IN SOUTH AMERICA.

Scale 1 : 70,000,000.



Viewed as a whole, the South American hydrographic system is remarkable for the prodigious volumes which are carried seawards by the main arteries, and much of which expands in the interior, not into deep lacustrine depressions, but in lateral backwaters and labyrinths of temporary channels, varying from year to year, and from season to season, with the periodical flooding and subsidence of the main streams.

Geologists who have studied the contours and general incline of these inland regions find that the movement of waters has been developed in two principal directions, one parallel with the meridian, and indicated chiefly by the trend of the Paraguay and of the Parana, the other intersecting the first at right angles, and flowing from the Andes to the Atlantic. The Amazons, a "liquid equator," as it has been called, follows the main axis of this second hydrographic system. The aspect presented by the semicircle of the Andes between the Bogota and Bolivian plateaux attests the vast work of erosion that has been accomplished in this upland region. The eastern slope of the Cordilleras has evidently been eaten away by the running waters to an enormous extent; numerous lateral ridges have been entirely levelled, and their triturated debris has been distributed by the streams over the beds of great inland seas, which at one time occupied the central region of the continent. The sedimentary matter thus carried down towards the fluvial estuaries was regarded by Humboldt as of old red sandstone origin, while Martins attributed it to triassic formations. But in reality these deposits are comparatively recent quaternary clays and sands, and according to Agassiz are partly of glacial origin.

The part of the Andean system that has best resisted the fluvial action is the huge mass of the Bolivian uplands. This central fortress of the South American rampart is no less than 500 miles broad between the escarpments which plunge into the waters of the Pacific and the eastern plains still roamed by the nomad Indians; but a little farther north, in the very axis of the Amazons, under 3° south latitude, the main range of the Cordilleras is reduced to a thickness of scarcely more than 120 miles.

East of Bolivia the headstreams, which trend some to the Amazons, some to the Paraguay basin, have not been strong enough to sweep away the Andean foothills. Along the parting-line the expanse of level plains intervening between the paleozoic Andean rocks and those of the Brazilian plateaux has a normal breadth of no more than 250 miles; towards the centre it is studded with numerous hills and isolated ridges, surviving witnesses of the crystalline nucleus and other formations which at one time occupied the whole continent from sea to sea. The passages which the Amazons and the Orinoco have had to cut for themselves through the coast ranges are much narrower still than this central depression. Between the Tapajoz and Xingu mouths the Amazons valley is scarcely 60 miles broad from hill to hill.

FORESTS AND HABITABLE LANDS.

The enormous excess of pluvial waters which distinguishes the southern continent, and which has created this astonishing system of ramifying streams, has, however, conferred little more than a nominal advantage on its inhabitants, at least in the equatorial zone. Such liquid masses are too copious, too irregular in their regime to be controlled by man, who till recently has scarcely been able to utilise them even for navigation. Moreover, the tepid and oppressive climate has hitherto been opposed to the acclimatisation of the white and half-

caste races in large numbers. The soil, with its excessive fertility, has clothed itself with continuous woodlands, a tangled mass of vegetation overflowing with sap, where whole generations will be unable to effect more than a few narrow clearings.

The Amazonian forest, which the Spaniards call the *Selva* in a pre-eminent sense, and which is continued southwards by the *Matto Grosso* of the Portuguese, covers a space estimated at 2,800,000 square miles. In this boundless expanse travellers, and even the seekers for rubber, ipecacuanha and other medicinal or economic products, have for the most part no knowledge of the *Selva* beyond the winding avenues opened in its shade by the rivers and backwaters. This densely timbered and almost uninhabited region separates the low-lying Venezuelan plains from those of Bolivia more effectually than if it were an absolute desert.

Thus, despite its immense wastes of snow and ice, despite its tundras of mosses and lichens, which occupy about one-third of its whole area, North America offers at the present day a far more favourable territory for settlement than the southern continent. Its chief advantage is that the temperate zone, which is best suited for the development and prosperity of the white race, comprises its broader part, where the United States have been constituted. In South America, on the contrary, the corresponding section begins where the land, already considerably contracted between the two oceans, continues to taper rapidly in the direction of the austral seas. Measured on Berghmann's map by the isothermal lines of 46° and 68° Fahr., this climatic zone comprises over 4,000,000 square miles in the northern, and somewhat less than 2,000,000 in the southern continent.

COMMUNICATIONS.

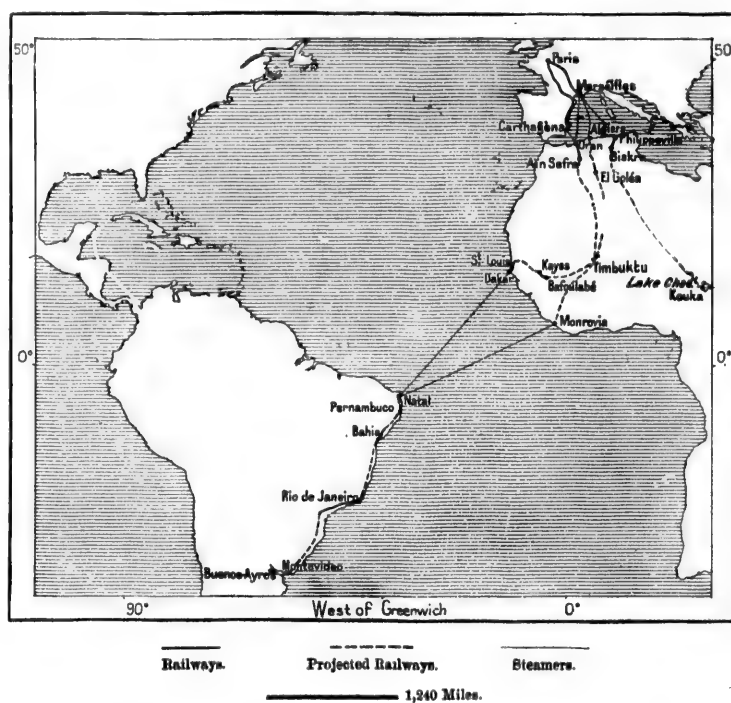
Another disadvantage of the South compared with the North as a region of colonisation results from its more remote position from the other great divisions of the globe. Apart from the Antarctic polar lands, South America is farther removed than any other continental region from the great commercial marts, and from the most densely-peopled countries—West Europe, India, and China—whose central point about coincides with the middle of the Eastern Hemisphere. Nevertheless, steam has helped greatly to shorten the time formerly occupied in the voyage from the European Atlantic ports to those of Colombia, Brazil, and Argentina. With the resources supplied by the mechanical arts, it may even be possible in the near future to bring the eastern ports of Brazil practically as near to London and Paris as are New York and Montreal at present.

The South American coastlands are already directly connected by regular lines of steamships with those of Europe, but the construction of the projected north-west African railways may even reduce by one-half the journey between these points. In this respect the "Trans-Saharan" trunk line should be regarded as of more importance for South America than for Europe. Some French speculators, inspired more by colonial patriotism than by economic interests, are at present occupied with various schemes for connecting by rail the Mediterranean seaboard with the Sahara, Sudan, and Senegal.

Doubtless a line running from Algiers to Lake Chad, and continued southwards to the Ubanghi and the Congo, would at some futuro time possess an undeniable value in developing and utilising the still untouched resources of those regions. But the lines already begun at Philippeville, Algiers, and Oran would, if continued south-westwards to Dakar, present the advantage of not only connecting Algeria and Senegal in a single commercial and political zone, but, as has already been pointed out by the engineers, would also serve to swell the great stream of international traffic between Europe and South America. Swift-sailing

Fig. 3.—FUTURE ROUTES BETWEEN PARIS AND BUENOS AYRES.

Scale 1 : 110,000,000.



liners, such as those now plying between Liverpool and New York, could cross the Atlantic between Dakar and the Brazilian ports of Natal and Pernambuco in less than three days; and on this short route at one of the narrowest parts of the ocean, passengers would have the pleasure of sighting land twice, at the islands of São Paulo and Fernando Noronha. The great Transatlantic line connecting the three continents might also be continued by a coast railway from Pernambuco to Buenos Ayres, with branches ramifying into the interior of the continent. By this route, at the present speed of the most powerful engines, the traveller might

reach Buenos Ayres from Paris in eleven days, that is, in a third of the time occupied by existing lines.*

EXPLORATION OF THE SEABOARD.

The work of discovery, begun in North America centuries before the time of Columbus, was retarded in the southern continent by its greater distance from the populous and trading lands of the Old World. No Norse sea-rover ever landed on its shores; no legend anterior to the age of the great navigators speaks of mysterious islands dimly seen by monks wandering, like St. Brendan, in these remote waters of the austral hemisphere; the pretended Phœnician inscription said to have been found on the banks of the Parnahyba, in equatorial Brazil, was no more authentic than so many others reported from various parts of the New World.

The Spanish caravels had already been plying for six years in the West Indian waters, when Columbus, in 1498, reached the mainland near the Orinoco delta. He recognised the importance of this immense watercourse; but he explored none of its branches, and, escaping from the Gulf of Paria by one of the "Dragon's Mouths," where the marine currents clash, he hastily returned to his mines and plantations in Española.

Next year Peralonso Niño and Cristobal Guerra landed in their turn on the shores of the mainland, which they traced for some distance in the direction of the west, trading as they went with the natives. Then followed a few months later the memorable expedition of Hojeda, who was accompanied by the learned pilots, Juan de la Cosa and Amerigo Vespucci. The party extended its explorations for over 600 miles between the muddy shores of the present Guiana and the peninsula roamed by the Goajiros Indians, west of the Gulf of Maracaibo.

During the first two years of the sixteenth century Bastidas de Sevilla completed the survey of the Columbian coastlands as far as the Gulf of Uraba. About the same time the shores of the continent facing Africa were also visited by European navigators. Vicente Pinzon explored the coasts and fluvial estuaries of the Guianas, sailed into the "Freshwater Sea" encircling the Amazonian island of Marajo, and coasted the shores of the present Brazil to and beyond its easternmost headland of Cape São Roque. Diego de Lepe traversed the same waters, while Alvarez Cabral, striking the land at Porto Seguro farther south, reported the discovery of the "island" of Santa Cruz, which subsequent discoveries showed to be a part of the continental seaboard visited by his predecessors.

Then Amerigo Vespucci traced the coastline as far as the bay of Cananea, south of the present Brazil, and hither came Gonneville and other Normans of Dieppe

* Dimensions of South America according to Ch. Perron:—

Superficial area with adjacent and dependent islands	6,740,000 sq. miles.
Mean area of the other continents with their islands	8,950,000 sq. miles.
Coastline	18,000 miles.
Extreme length	4,500 miles.
Extreme breadth	3,100 miles.
Extreme distance from the centre to the coast	1,740 miles.

in search of spices.* These were soon followed by Vicente Pinzon and Diaz de Solis, who in 1509 entered a great river which six years later Solis surveyed more in detail. This was the vast southern estuary which receives the two rivers, Uruguay and Parana, and which was at first named the Rio de Solis. But when Sebastian Cabot discovered, in 1528, that the Parana branch led inland in the direction of the Peruvian silver-mines, the name was changed to that of the Rio de la Plata ("Silver River"), which the estuary still bears.

Magellan's memorable expedition of 1520-21 completed the discovery of the Atlantic coast of the New World as far as the entrance of the strait which separates the mainland from the Fuegian archipelago. Six years later, Francisco de Hoces, one of Loaysa's companions, coasted the seaboard without entering the strait, and thus reached the southern extremity of Tierra del Fuego close to the point where the two oceans intermingle their waters. But although the sailors taking part in the expedition unanimously declared that they had seen the "land's end," these shores were not accurately traced till the next century, when Le Maire rounded Cape Horn in 1616.

The west coast of South America being further removed from Europe, its survey was naturally subsequent to that of the Atlantic seaboard. Thirty years followed the discovery of Guanahani before Andagoya, advancing beyond the Gulf of Panama, coasted the shores of the Pacific in the direction of the mysterious Biru, or Piru (Peru), which Francisco Pizarro went in search of two years later. In 1527 he reached Tumbez, its northernmost point, just below the Gulf of Guayaquil; and thenceforth the discovery of its shores and alpine coastlands went hand in hand with the conquest of the Peruvian empire. In 1534 Almagro had already pushed across the elevated plateau of the Andes and the Atacama desert as far as the northern districts of Chili.

In 1540 Valdivia penetrated still farther south along the narrow strip of Chilian coastlands between the crest of the Andes and the Pacific. But here all further exploration of the seaboard in the direction of Tierra del Fuego was long arrested. Little, in fact, was done before the present century beyond making a summary survey of the coast as seen from the ocean. A ship belonging to Loaysa's squadron had certainly passed through the Strait of Magellan towards Mexico so early as 1526, but its course lay too far seawards even to sight the coast of Chili. Fourteen years later Alonzo de Camargo, following in the same direction from the strait towards Callao, kept near enough inshore to determine the exact trend of the continent along the Pacific Ocean.

In 1579 Sarmiento, one of Spain's best pilots, made the voyage in the opposite direction from north to south, and the coastline, as traced by him, gave a tolerably correct reproduction of its true form. Drake, also, studying the best routes by which the Spanish settlements might be surprised, contributed not a little to a more accurate knowledge of the southern coastlands. Their exploration is still continued, and must last some time longer before complete surveys can be made of

* D'Avezac, *Nouvelles Annales des Voyages*, 1869.

the Chiloe and Fuegian archipelagoes, with all their intricate passages, projecting headlands, groups and chains of reefs and islands.

EXPLORATION OF THE INTERIOR.

If the cartography of the seaboard is not yet completed, that of the interior is even still more defective, despite the thousands of itineraries spread like a network over the well-known settled regions, and carefully reproduced in all their details on modern maps. The Conquistadores were the first explorers, and the geographical history of the continent begins with the reports of their expeditions. The Pizarros, the Almagros, the Valdivias, and their lieutenants brought under their dominion every city, every civilised tribe throughout the uplands and western valleys of the Peruvian and Chilian Andes.

Farther north, in the Venezuelan and Colombian regions, other captains and leaders of armed followers—Germans in the service of the bankers of Charles V., or Spanish adventurers in search of fresh conquests and new viceroyalties—also forced their way through savannas, across mountains and rivers, losing half or more of their followers on the march.

Alfínger, "cruellest of the cruel," roamed as a hunter of men the upland regions, where are intermingled the headwaters of the streams which flow in one direction to the Maracaibo inlet, in another towards the Rio Magdalena. Heredia, Cesar, Robledo, Fernandez de Lugo penetrated into the mountainous northern districts of the present Colombia. Fredemann, after traversing the overhanging cliffs between the Venezuelan seaboard and the plains of the Orinoco, retraced his steps to the coast, and then went in quest of the plateaux occupied by the empire of the Muyscas. When at last he reached this mysterious region beyond the forests, the river gorges and woodlands, he found himself, to his utter amazement, forestalled by other European conquerors who, in absolute ignorance of their rivals' movements, had penetrated by other routes to the same place. Quesada, starting from Santa Marta, had ascended the course of the Magdalena as far as the Opon confluence, whence he had made his way to the Cundinamarca plateau, while Belalcazar, at that time in Quito, had arrived at the same goal from an opposite direction by traversing the Tuquerres plateau and crossing the central Cordillera and the upper Magdalena. Like three vultures swooping down on the prey, they were fain, much to their regret, to share the booty between them.

These expeditions towards the capitals of empires, towards cities to which roads had been opened by the natives from time immemorial, were succeeded by an epoch of journeys made at haphazard towards visionary regions. Nothing seemed impossible to these men, who, after the first years of monotonous life in Spain, suddenly found themselves launched on a marvellous career of battles and triumphs, traversing seas and continents, and sweeping whole populations away as in a storm. All the doughty deeds related in their romances of chivalry they had themselves performed.

There remained nothing now but to crown their work with miraculous achievements, to triumph with magic weapons over dragons and demons, to

conquer golden palaces, paved with diamonds, and adorned with colonnades of glittering gems. Had not Columbus already declared that the Orinoco issued from the "Earthly Paradise"? And so they set out in quest of that marvellous land whence their first parents had been expelled by the archangel. No failure could damp their sanguine hopes or turn them aside from this pursuit of the unknown. Every Indian legend, every hallucination of wearied wayfarers, every fleeting mirage on the distant horizon, seemed in the eyes of the eager adventurers a fresh vision of the enchanted city where reigned the Man of Gold, the potent Dorado! For over a century all the expeditions made east of the Andes in the Orinoco and Amazons basins were directed or inspired by these fanciful visions.

One of the first of these treasure-seekers was the same Diego de Ordaz, companion of Cortez, who had already visited the crater of Popocatepetl in the hope of there finding liquid stores of the precious metals. In 1531 he ascended the Orinoco to the Meta confluence, that is, to the great plains extending from the inner slopes of the Andes to the Amazons basin. Gonzalo Pizarro, brother of the founder of Lima, also undertook a great journey in the quest of gold, but during his descent of the Rio Napo he found nothing more precious than the "cinnamon-tree," which was at first supposed to be as efficacious as the Ceylon plant, but which has since been neglected as worthless.

But the bark of a tree, however valuable, could scarcely suffice to sate the greed of a Pizarro. He accordingly continued his route beyond the cinnamon forest; but the morasses, the impenetrable masses of vegetation, the snags in the river, strewed his path with such difficulties that he was obliged to send forward a scout to explore the lower Napo and the mainstream of the Amazons. Unfortunately, he placed too much confidence in Orellana, who had been selected for this pioneer work, and who was himself eager, even at the price of treason, to acquire the glory, perhaps the profit also, of the discovery. He accordingly launched on the broad stream, drifting with the current from island to island, from bank to bank, all the way to the "Freshwater Sea" formed by the immense body of Amazonian waters spread over the Atlantic floods. For the first time the South American continent had been traversed from shore to shore, and, as it happened, the course followed nearly coincided with the equatorial line, not far from the zone where it acquires its greatest breadth.

This journey made by Orellana down the Amazons, and by his contemporaries regarded as prodigious, had several imitators amongst the pioneers and missionaries of those times. But the voyage up-stream was delayed for nearly another century, till 1638-9, when Captain Pedro Texeira ascended from Grão Para to the city of Quito with a flotilla of forty-seven canoes, containing 70 Portuguese soldiers, 1,200 Indian sailors and soldiers, and the like number of women and children.*

Gold-hunters descending from the upland valleys of the present Peru and Bolivia, also explored the waterpartings between the Amazons and La Plata

* M. J. de la Espada, *Viaje del Capitán Pedro Texeira Aguas arriba del Rio de las Amazonas*.

basins. Settlements were even formed in the Caravaya forests, which clothe certain parts of this dividing region. But such was the greed of the Spaniards that they murdered each other to prevent the coveted gold-mines from falling into other hands. Of two small bands of adventurers who came into collision in the mining district, not more than three persons escaped from the massacre.* Solitude was thus restored to these regions, where millions might live in comfort, and even now, after an interval of three hundred years, lands have to be again discovered which were visited by the first conquerors, and by them connected with the flourishing cities on the seaboard.†

A similar fate overtook the numerous missions founded by the Franciscans, the Dominicans, and especially the Jesuits, who grouped together the savage populations for the purpose of instructing them in the simpler crafts of European society, at the same time teaching them to recite the phrases translated from the catechism and the Latin text of the prayers and responses. Doubtless the missionaries were not all attracted to these difficult regions inhabited by formidable Indian tribes through zeal for the faith and the desire to evangelise the natives. A certain number of them came to reduce their folds to the condition of slaves; nor did they yield to the leaders of military expeditions in greed for worldly things.

But, on the whole, they were far superior to these adventurers in intellectual and moral worth, and to them we are indebted for some valuable itineraries, amongst others those made by Samuel Fritz in various parts of the Upper Amazon basin. The *Lettres Edifiantes*, in which their reports are collected, contain geographical and ethnological documents of the highest interest. Nevertheless there is scarcely an Indian village founded by these missionaries in the wilderness that has survived to our days. In the struggle for existence that raged amongst the surrounding populations, the wild tribes, being of bolder and more independent spirit, proved to be by far the stronger of the two elements. The groups of neophytes, having too rapidly changed their habits, and being still in an unstable or transitional stage of culture, yielded in far larger numbers to the ravages of European epidemics. Nation after nation was seen to disappear

* Clements Markham, *Expeditions into the Valley of the Amazon*, Hakluyt Society.

† Chronological order of the chief itineraries in South America during the first century of discoveries:—

Columbus	1498-1504	Cesar	1535
Niño, Guerra	1499	Almagra	1535
Hojeda, Amerigo Vespucci	1499-1501	Tomas de Berlanga	1535
Bastidas, Juan de la Cosa	1500	Ayolas	1536
Pinzon	1500	Quesada	1537
Diego de Lepe	1500	Belalcazar	1537
Alvarez Cabral	1500	Fredemann	1537
De Gonneville	1504	Badillo	1539
Diaz de Solis	1509	Valdivia	1540
Magellan	1520	Gonzalo Pizarro	1540
Andagoya	1522	Orellana	1540
Francisco Pizarro	1524-1540	Camargo	1540
Sebastian Cabot	1528	Irala	1544
Alfínger	1530	Sarmiento	1579
Diego de Ordaz	1531	Sebald de Wert	1598
Heredia	1533	Juan de Sosa	1609

before these maladies, melting away like mounds of snow in the sun. Then, when it came to the issue of war, the civilised tribes, being less daring, less inured to hardships, less confident in themselves, assumed a passive attitude, awaiting the orders of their new chiefs, without daring to take the initiative in resisting the attacks of their enemies. Thus it came about that districts densely peopled by peaceful communities again became a wilderness; hundreds and

Fig. 4.—CHIEF ROUTES OF THE SPANISH CONQUERORS IN SOUTH AMERICA.

Scale 1 : 60,000,000.



hundreds of tribes have left nothing but their name more or less accurately transmitted to posterity.

In the war of extermination waged by Brazil and the Argentine Republic against Paraguay, it was seen how the docile populations descended from those of the old Jesuit missions allowed themselves to be stupidly butchered by the half-castes of the Brazilian plateaux. Numerous villages founded in the first days of the conquest have disappeared, and beaten tracks hundreds of years old are now

overgrown with tall herbage and trees. The work of discovery instead of progressing continued for a long time to recede, so that the children began to doubt or to forget what their fathers had done; certain formerly well-known districts fell into complete oblivion.

During the long colonial period, journeys deviating from the frequented highways occurred only at long intervals. On the other hand, even the most successful expeditions served but little to increase the general knowledge of the land, for the jealous Spanish and Portuguese Governments sought to reserve for their own use the acquired results, keeping many precious documents in their secret archives, where they became worm-eaten past recovery.

The navigators of all nations continued the systematic survey of the coastlands, while the interior of the continent still remained wrapped in a dense cloud of ignorance. The detailed reports, accompanied by maps, which the officials were required to forward to the Council of the Indies on every province of the vast colonial domain, reports which are now of such value to students, were never published, and remained neglected by their custodians. Thus, at the time of the union of the two kingdoms, a joint Hispano-Portuguese expedition was made in 1638 up the Amazons between Para and Quito. But the Spanish Government, which had allowed the monk Acuña to write an account of the voyage, hastened to confiscate the book as soon as the Portuguese had recovered their independence. It feared that this work, the first that gave a detailed description of the great river, might be of service to some enemy.*

The epoch of scientific exploration began with the researches of Feuillée, a priest and astronomer, who, in 1707-12, made the circumnavigation of the southern shores of America in order to determine the exact position of a few points on the seaboard. But the modern geographical history of the continent may be said to date from the time when Bouguer, Godin, La Condamine, and Ulloa undertook the measurement of an arc of the meridian of about three degrees between the two parallel chains of Ecuador.

Over a century and a half has passed since the memorable year 1736, when the learned geometricians landed at Guayaquil, and made their way to the group of mountains which they had to measure, and which was at that time regarded as the culminating point of the globe. Many were the difficulties which they had to overcome, in an almost desert region, destitute of communications, furrowed by tremendous ravines, exposed to frequent earthquakes, covered lower down by almost impenetrable forests, higher up by rocks and snows. Hence the work, although steadily prosecuted, lasted six years; but it was of supreme importance, not only for the study of South America, but also for that of the whole world, and for determining the exact shape of the planet.

It is a remarkable fact, attesting the extreme care with which the scientific commission carried out its labours, that the positions assigned by it to the cities of the plateau and to the surrounding mountains were far more correct than those

* Acuña, *Nuevo Descubrimiento del gran Rio de las Amazonas*; C. R. Markham, *Expeditions into the Valley of the Amazons*, Hakluyt Society.

obtained sixty years afterwards by the great Humboldt when determining certain astronomic points in Ecuador. All the cartographic documents prepared during the course of the present century down to recent years had taken for their base Humboldt's observations of latitude and longitude, with the result that the section of the northern Andes between Bogota and Cuzco was shifted much too far west-

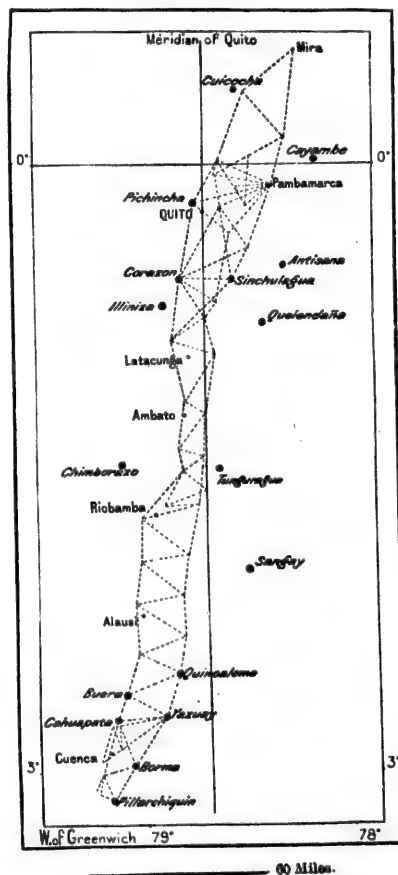
wards. In some places, notably between Guayaquil and the inland city of Alausi, the error was as much as 20 geographical miles.* Hence all the lines on the map had to be altered, so as to correspond with the old network traced by Bouguer and his associates. On his return La Condamine, descending the course of the Amazons, prepared the first chart of the river based on astronomic observations.

The Spanish Government had departed from its traditional policy in allowing the French geodesians to establish themselves in its American colonies. Over fifty years afterwards it made a like concession in favour of Alexander von Humboldt and his companion, Aimé Bonpland, who were permitted to visit its Transatlantic territories without any restriction. Landing in 1799 at Cumana, the two travellers traversed Venezuela; placed beyond doubt the remarkable bifurcation of the Orinoco already well known to the missionaries and local traders, but at times questioned by ignorant writers of the Old World; visited the Bogota plateau, the upper Magdalena basin, Quito, and its lines of volcanoes.

Humboldt tried to scale Chimborazo, which he believed to be pre-eminently the giant amongst the great mountains

Fig. 5.—DETERMINATION OF THE MERIDIAN OF QUITO.

Scale 1 : 5,500,000.



of the globe; although he failed to reach the summit, he reached a higher point on its slopes than any other previous climber. He never completed the description of his five years' travels in the "equinoxial regions." Nevertheless, his studies, embracing all phenomena of planetary life, as well as the discussion of all problems associated with them, became a veritable guide and *cade-mecum* for

* Theodor Wolf, *Verhandlungen der Gesellschaft für Erdkunde zu Berlin*, Nos. 9 and 10, 1891.

a large number of inquirers who entered either as disciples or rivals on the same career of scientific exploration.

Humboldt's journey was thus not only of capital importance for the history of Spanish America, but it must also be considered as the event which has given the most powerful impulse to the comprehensive study of the great terrestrial organism. Humboldt has even been called, though with some exaggeration, the "founder" of meteorological geography, of pelagic science, and of geographic botany. He devoted half a century to an orderly digest of the materials collected during his expedition.

Since this pioneer, legions of naturalists or men of leisure have traversed the various regions of South America, and hundreds of them have left their mark on the history of the discovery. By their itineraries they have modified the relative positions of many places wrongly laid down on the maps, and by their observations they have contributed in various degrees to a better knowledge of the country and its inhabitants. Thus Von Eschwege and, after him, Maximilian von Wied, Auguste de Saint-Hilaire, and, in a more complete and thorough manner, Spix and Martius explored in various directions the interior of Brazil and the Amazonian lands, some as geologists, others as botanists or anthropologists.

Pentland sojourned on the elevated Bolivian plateaux, and measured the encircling giants, to which, however, he wrongly assigned the first rank amongst the loftiest summits of America. D'Orbigny, Castelnau, and Marcoy devoted themselves especially to the geography of the central regions between the La Plata and Amazon basins; and while they were plodding patiently through the forests, heading or drifting with the stream, Darwin was making the famous voyage round the continental periphery where he collected the materials which, combined with the observations of Wallace and Bates on the banks of the Amazons and its affluents, were destined to help in definitely establishing the theory of the *Origin of Species*. It was through the exuberant life of the South American world, through the study of its plants and animals, that Darwin, Wallace, and Bates ushered in the order of research which has renovated science.

Each of the several South American regions had its special explorers, who contributed to determine its relief, to reveal its natural resources, and throw light on the character of its inhabitants. Thus the island of Trinidad has been described by Welle, Sawkins, De Verteuil and Kingsley. Codazzi, Myers, Sachs, Ernst, Sievers, Chaffanjen have distinguished themselves by their travels in Venezuela and neighbouring lands. Colombia has been explored in every direction by Raulin, Boussingault, Ancizar, Acosta, Karsten, Stübel, Reiss, Saffray, André, Steinheil, Hettner, and Vergara. Wolf, Rémy, Whympers, and De la Espada have studied Ecuador in its relief, its physical features, and natural history. Peru, one of the best-known regions of South America, has been traversed in all directions by Poeppig, Tschudi, Rivero, Bollaert, Angrand, Markham, Wiener, Paz Soldan, Raimondi, Simons. The Bolivian tracks have been followed by Weddell, Orton, Minchin, Reck, Guillaume. Domeyko, Philippi, Gay initiated the exploration of Chili, which has since been continued by numerous geologists and engineers.

Cox, Moreno, Musters, Rogers, Moyano, Lista have ventured into the wilds of Patagonia and Tierra del Fuego. Martin de Moussy, Burmeister, Page, Crevaux, Thuar, De Brettes, and many others have led the way for settlers, miners, and traders in the Argentine lands. In the vast Brazilian domain Agassiz and Hart have ascended the Amazons in the wake of numerous predecessors. Halfeld has prepared the map of the San Francisco basin; Wells has studied the fluvial valleys inclining towards São Luis de Maranhao; Von den Steinen has ascended the Xingu; Ehrenreich has resided amongst the Carib Indians of the Amazonian woodlands; Church has surveyed the Madeira and its rapids. The exploration of the Purus, begun by Chandless, has been completed by Labre, who has connected the various routes of this river and its affluents with the course of the Madre de Dios and of the Mamoré. Sosa's exploration of the Iça (Putumayo) between Ecuador and Amazonia has been resumed after a lapse of two hundred and fifty years by Crevaux and Simson. Lastly, in the Guianas, where Schomburgk had opened the way to the interior, and where Appun and Brown had made important geological and natural history studies, Crevaux and Coudreau have advanced across the mountains and descended by various routes towards the banks of the Amazons. Every year numerous travellers continue the work of discovery, and their steps are followed by miners and railway builders.

Nevertheless there still remain vast territories in South America which have never yet been traversed and described by any white man; notably in the boundless forest region of the Amazons valley there are compact spaces, 20,000 square miles in extent, which still await the explorer. In these districts the course of the rivers has been traced at haphazard or on hearsay reports. No part of the continent has been figured with an accuracy comparable to that of the charts of West Europe. Even the countries which have made the greatest progress in this respect, the Colombian plateau, Chili, West Peru, the Argentine Republic, possess no thorough surveys. The best charts are naturally those of the seaboard frequented by the mariners of all nations, and those of the agricultural and mining regions in the interior, where the populations are already grouped in numerous towns and cities.

II.

The triangular mass of South America forms two distinct natural divisions, differing greatly in their form, relief, climate, products, inhabitants, and historic evolution. In the western section of the continent are comprised the mountain ranges of varying size and altitude, and of comparatively recent origin, which follow the coastline of the Caribbean and Pacific waters between the two extreme points of Trinidad and Staten Island, and which have a total development of no less than 5,900 miles. The eastern section, less in absolute length, but of far greater superficial extent, embraces the vast plains of the interior, together with the irregular mass of uplands which skirt the Atlantic as far south as the La Plata estuary, and which are of great geological age.

The political divisions of the continent correspond in a general way with

these natural features. Thus the three republics of the ancient province of Colombia (Venezuela, Colombia, and Ecuador), Peru, Bolivia, and Chili, all belong to the western (Andes) section; while the Guianas, Brazil, and the Argentine States form part of the eastern section, sloping towards the Atlantic. The limits, however, of the respective physical and political divisions are far from coinciding with any approach to accuracy. With the exception of Chili, comprised entirely within the Pacific slope, all the Andean states encroach considerably on the inland plains. The whole of the Orinoco basin, although lying in the Atlantic area of drainage, is, nevertheless, comprised within the two Andean republics of Venezuela and Colombia. But these frontiers, laid down by diplomatists, run for nearly their entire length through regions inhabited only by the aborigines and a few half-castes. Even in the eyes of the geographer their importance is but slight.

THE ANDES OROGRAPHIC SYSTEM.

The characteristic feature of South America, as compared with other continents, is the remarkable regularity of the orographic system which forms its backbone. From east Venezuela to the Strait of Magellan the line of the Andes nowhere presents a single break. Throughout its vast extent, however, it ramifies into two or more foldings, for the most part parallel, and enclosing extensive elevated and level tablelands. The system develops two main curves—the first, intersected by the equator, turns its convex side towards the Pacific, and projects its most advanced point at the headland of Punta Pariña in north Peru; the second, sweeping round to the south-east and south, has the centre of its concave side at the point where now stands the city of Arica.

South of Arica the system runs parallel with the coast nearly in a straight line from north to south. But towards the extremity of the continent it develops a second convex curvature, traced as if with the compass, which is continued seawards by a submarine ridge connecting Tierra del Fuego with the archipelago of South Georgia.

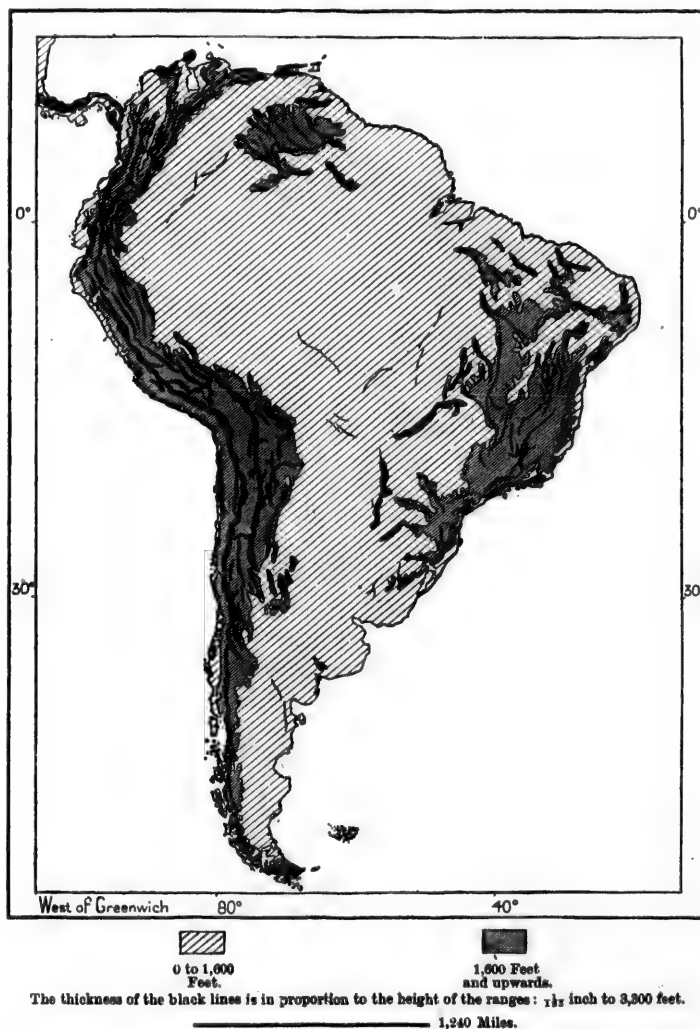
Everywhere the Andes hug the coastline, and in many places, as at Guayra, in Venezuela, the escarpments plunge sheer into the sea, where they are continued, without any intermediate terraces, down to the abysses of the oceanic cavities. No real plains occur between the foot of the mountains and the seashore, except in the northern provinces of Colombia, where, thanks to the abundant rainfall, the eroded rocks have been transformed to broad alluvial flats. On the Pacific side, where the rainfall is much lighter, there are scarcely any plains, but only a series of terraced lands between the mountains and the sea. Here also the marine waters deepen rapidly, abysses of 1,000 fathoms occurring normally within 120 miles of the coast. Thus the submerged roots of the Andes present an aspect analogous to that of the upraised slopes, except that their incline is considerably less abrupt. Evidently the coast ranges and the coastline are due to the same cosmic phenomenon.

But, however regular it may be in its main outlines, the Andes orographic system presents great differences in its several sections, which vary in breadth and altitude

as well as in the number of their parallel or divergent chains. The great central plateau, which may be called the heart of the Andes, is one of those where the ramifications are most numerous; but these ramifications are mere ridges compared with

Fig. 6.—OUTLINES OF THE ANDES AND OF THE EASTERN HIGHLANDS.

Scale 1 : 56,000,000.



the huge pediment of the elevated tablelands, which have a mean altitude of from 14,000 to 16,000 feet for a space of over 80,000 square miles.

From the Pacific shores eastwards to the plains watered by the Amazon and La Plata affluents, the uplands of the Bolivian Andes have a breadth of from 460

to 500 miles in a straight line. In this highland region are found, if not the culminating point of the South American continent, at least the groups of peaks and domes which have the greatest mean altitude. Here rise Illampu and Illimani, both of which exceed 21,000 feet. These giants indicate with sufficient accuracy the central point of the Andean system, and the central points of the northern and southern sections are similarly indicated by the other loftiest summits of America—in Ecuador, Chimborazo, long supposed to be the highest mountain in the world; and in the Argentino-Chilian Andes, Aconcagua, which at any rate is the culminating peak of the New World. Besides these extreme summits, dozens of other crests in Venezuela, in Colombia, and in all the other Pacific states exceed 13,000 feet, an altitude far above the zone of arborescent vegetation.

SNOWS AND GLACIERS.

The snow-line varies with the latitude; but, as Whymper asks, what is this line? Certain completely isolated mountains of the Ecuadorian Andes have no permanent snows at 16,500 feet; others, more exposed to the moist winds and less subject to rapid evaporation, remain white throughout the year at an altitude exceeding 14,450 feet. Speaking broadly, the snows descend lower and are more abundant in the eastern highlands facing the trade winds than on the western ranges; for each summit also the rule holds good, the eastern being more snowy than the western slope.*

In the equatorial Andes from the Nevada de Santa Marta to the Bolivian uplands the limit of perpetual snows may, in a general way, be said to oscillate between 14,750 and 16,400 feet. By a remarkable contrast, the explanation of which must be sought in the varying proportions of moisture brought by the prevailing winds, the snows descend as a rule considerably lower on the domes and cones of Ecuador, that is, on the equinoxial line itself, than on the Bolivian and Argentine mountains, under the southern tropical line, or even within the temperate zone. The Sierra de Zenta, which rises to 16,400 feet under the tropic of Capricorn, is never snow-clad in summer, and rarely in winter.

In the Bolivian Andes Pentland tells us that no perennial snows are met on the western slopes lower than 18,370 feet. The flakes are evaporated as fast as they fall without passing to the liquid state to form running waters. The vapoury cloudlets that are seen during the heat of the day rising above the summit of the mountains are the snows returning in this form to the atmosphere.† But south of this zone of dry winds the line of persistent snows is rapidly lowered by the abundant moisture precipitated by the clouds. In the Magellanic archipelago and in Tierra del Fuego the lower limit stands at about 4,900 feet.

Glaciers have been seen in all the Cordilleras in the tropics exceeding 13,000 feet, as, for instance, on the Nevada de Santa Marta, the Sierra de Cocui and the Mesa de Hervey, in Colombia. Humboldt having seen none in the Ecuadorian Andes, either because of the foul weather or because they were covered in some

* Edward Whymper, *Travels amongst the Great Andes of the Equator*.

† Martin de Moussy, *Confédération Argentine*.

places by shingle, in others by fresh-fallen snow, denied their existence in these tropical Alpine regions. But he was mistaken, as the observations of Whymper have clearly shown. Certain great igneous cones in the Quito district have their circular snowfields fringed with as many as fifteen glaciers, scored by crevasses, furnished with lateral and frontal moraines like those of the European Alps.

In the Bolivian Andes, Illimani has also its frozen rivers, and in Chili the rapid lowering of the snow-lines corresponds with the appearance of numerous glaciers. South of the 35th parallel every upland coomb receives its crystal stream descending lower and lower towards sea-level. In the inner channels of the Magellanic archipelago, a glacier may be seen issuing from every valley on the mainland. Towards the southernmost point of the continent the crystalline masses at last reach the seashore, where they break away in small blocks which are borne northwards by the marine current.

VOLCANOES.

The Andes belong to those orographic systems in which numerous volcanoes have cropped out through rocks of a different formation. Nevertheless, the subterranean fires have not found "safety valves" along the entire length of the chain between the Caribbean Sea and the Strait of Magellan. On the mainland the craters are grouped in three great clusters, those of Colombia and Ecuador in the north, of Bolivia in the centre, and of southern Chili in the south. At least sixty still active cones rise above the Andean axis, and hundreds of others now quiescent formerly shared in the work of eruptions.

The line of igneous crests is even continued beyond the Fuegian archipelago, away to the Antarctic lands, where navigators have seen the clouds aglow with the flames issuing from burning mountains. West of the South American coast, and under the same latitude as the volcanoes of Ecuador, the Galapagos Islands form a short chain surging, as it were, above abysmal waters some 1,500 fathoms deep.

But east of the Andes along the prolonged axis of the Antilles, the South American continent has not a single eruptive cone. Here the igneous disturbances appear to be arrested at Trinidad and the opposite coast of Venezuela, where the oil wells and mud volcanoes may perhaps stand in some relation with the underground forces.

In this respect the contrast is certainly very marked between the two sections of the continent, the Andean region and that of the Guianas and Brazil. In the former the planetary life manifests itself with the greater energy, and this section is also the younger of the two. Formed in more recent geological epochs, it has not yet completed its upward movement. The several ranges, however, appear to have been upheaved in an extremely irregular manner, and some of the loftiest crests are amongst those whose origin dates from comparatively modern ages.

THE EASTERN OROGRAPHIC SYSTEM.

Taken as a whole, the Andine crests rose above the ocean during geological periods later than those that witnessed the birth of the eastern uplands in the

Guianas and Brazil. These consist chiefly of crystalline and archaic rocks, sandstones, and schists, which are overlain to a vast extent by mesozoic and, especially,

FIG. 7.—ANDER SCENERY. VIEW TAKEN AT THE CHAUPICHACA BRIDGE, LIMA—LA OROYA RAILWAY



cretaceous formations. In this respect the same contrast has been observed in the southern as in the northern continent. In the epoch of their appearance, as well

as in the altitude, general trend, and relative position, the Brazilian *serras* resemble the Alleghanies, while the Andes correspond to the Rocky Mountains, of which they were formerly regarded as the southern continuation.

Carved into a number of fragments by the great streams descending from the eastern slope of the Andes, the uplands facing the Atlantic present no continuity in the direction from north to south; in some districts they are even distributed without any apparent order. Thus the hilly Parima region, where so many gold-hunters hoped at one time to find the city of El Dorado with all its fabulous treasures, develops its main axis in the direction from the north-west to the south-east. The other Guiana ranges also follow, for the most part, in the same direction, as indicated in the intermediate valleys watered by the affluents of the Orinoco.

South of the Amazons several chains of low elevation have the same trend, running parallel with the coast between the Amazon estuary and Cape São Roque. But west of the Parnahyba and thence to the Rio Grande do Sul, the ranges are disposed mainly north-east and south-west, in the same direction as the seaboard. The more elevated and precipitous ranges are almost completely separated from the inland plateaux by the two valleys of the São Francisco and Parana, which are inclined in opposite directions, and which communicate across a low parting-line about the region of their sources. This double valley, which in reality forms only a single depression, is also roughly parallel with the Brazilian coast, whose sinuosities it follows at a mean distance of 300 miles, and for a total length of over 1,250 miles.

The loftiest summits of the Brazilian uplands lie under the same latitude as that part of the Andes where is situated, if not the culminating point, at least the most imposing group of the whole system. Like the Andes also, whose precipitous slopes face the Pacific, the Brazilian highlands, and especially the Serra do Mar, turn their steep escarpments towards the deep waters of the Atlantic.

UPHEAVAL AND SUBSIDENCE.

The eastern and western seabords differ, to a marked extent, in the changes of level that have taken place along their respective coastlines. Indications of an upheaval of the land, or else of a subsidence of the sea, are much more numerous, and give evidence of far more extensive oscillations on the Pacific than on the Atlantic side. In fact, the opposite movement has been at work along the east coast, where the encroachments of the ocean, either by actual upheaval or by a sinking of the land, are still going on to an extent which is probably unequalled in any other part of the world.

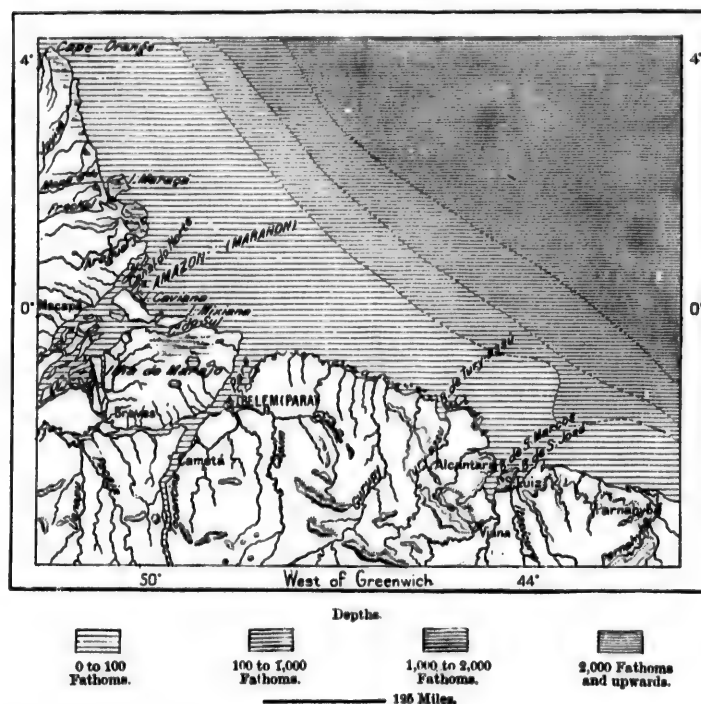
On the shores of Chili and of the adjacent island of Chiloe, as was already observed by Peppig over fifty years ago, there are everywhere visible old marine beaches of perfectly regular formation, and all covered with shells belonging to species of the present epoch. The studies of Darwin, Philippi, and Domeyko leave no doubt on this point. At the issue of all the valleys where occur lateral terraces, the remains of an ancient plain eroded by the running waters, the distinction has

been clearly established between the two types of terraces, which otherwise somewhat closely resemble each other in their general aspect.

In many places the beaches left high and dry by the retreating waters or by the upraised coast take the form of flights of steps, the highest of which stand over 1,000 feet above the present sea-level. Under the tropic of Capricorn the mountain range projecting beyond the normal shore-line, between the bay of Mejillones and Antofagasta, has been subjected to a still more violent thrust. At a height of 1,450 feet on the slopes of the Cerro Gordo are seen shell-mounds

Fig. 8.—REGION OF OCEANIC ENCROACHMENTS ABOUT THE AMAZONS ESTUARY.

Scale 1 : 11,400,000.



consisting of quite contemporary species, but in certain places associated with a cardium which is now found no longer in the Pacific, but only on the coasts of Africa. This extraordinary fact shows that at the epoch when the Cerro Gordo was submerged the distinctive Atlantic fauna was still represented on the Bolivian seaboard, thanks to one or more now obliterated marine channels.*

The depressions noticed on the Brazilian coasts extend over a vast space, comprising the entire margin of the Amazons estuary, and reaching eastwards as far as the Itapicuru and the Parnahyba. No other river brings down an equal quantity

* R. A. Philippi, *Die tertiären und quartären Versteinerungen Chile's*.

of alluvial matter, which represents at the lowest estimate a solid mass 45 square miles in superficial area, with a thickness of over 30 feet. The Mississippi, which discharges four or five times less mud and water, has nevertheless built up in the open sea an alluvial delta terminating in a system of mouths spread out in the marine waters like a branching mass of coral.

At the mouth of the Amazons the Atlantic has, on the contrary, opened a spacious gulf, and from century to century penetrates farther into the interior of the fluvial valley. The sediment washed down with the stream is not deposited in the gulf, which would else be rapidly filled up; but it is carried away by the marine current crossing the Atlantic from the Gulf of Guinea to the West Indies, and thus gets lost in the depths of the sea, or else is distributed along the slimy margin of the Guiana seaboard.

The work of erosion, aided doubtless by a general subsidence of the marine bed, progresses at such a rapid rate that observers have been able to record many indications of its action during the brief period of the last half-century. The shores retreat, so to say, and become indented by new inlets, while the shallow ramifying creeks are transformed to deep channels; the islands and islets slowly melt away until they disappear altogether; lighthouses erected at some distance from the shore have had to be replaced by others built still farther inland. Owing to this incessant encroachment of the sea on the mainland, the Amazons is estimated to have lost from 400 to 500 miles of its former length, and the old beach would now appear to be indicated by the 100-fathoms line.

The Parnahyba, the Itapicuru and the Tury-assu, former affluents of the main-stream, now reach the sea in independent channels; the Tocantins, also, which at one time flowed to the Amazons, is now connected with it only by a network of lateral branches, which shift their beds with the periodical floods of the tributary streams. Thus the invasions of the ocean are decomposing the great fluvial basin into secondary systems. Owing to these different oscillations of the seaboard—subsidence on the Atlantic, upheaval on the Pacific side—the whole continent may in a sense be said to have been displaced westwards: it has moved farther from Europe and nearer to Australia.

III.

The very nature of the soil and the continental relief are, no less than the vegetation itself, to a large extent the result of the climate, as determined by the prevailing winds, by the rainfall and the running waters fed by it. Thus the Orinoco has cut itself a passage through the northern coast range and the Guiana mountains. In the same way the Amazons has swept away the obstructions to its course, dividing into two sections the whole system of the eastern uplands. In the central parts of the continent, also, the waters, diverging in two opposite directions, have removed all the transverse ridges formerly connecting the Cordilleras with the Brazilian highlands.

To the effects of the climate must also be attributed the gradual contraction and lowering of the Cordilleras themselves in that part of the system exposed to

the action of the alternating north-east and south-east trade winds, both charged with abundant moisture, by which the rocks have been ravined and their detritus swept away. The lateral ridges formerly disposed parallel with the main range have disappeared; the geological strata, whose debris are still seen north and south of the breach, have been destroyed and replaced by drift of more recent origin, here and there heaped up around isolated knolls of the primitive formations. Should the work of erosion continue, the time may be foreseen when the Cordilleras will be completely pierced, when the Amazonian plains will be separated only by a sill of low elevation from the Gulf of Guayaquil.

But while the Andes have in this region been reduced to a narrow stem by the destructive action of the rains, in Bolivia they have, on the contrary, been maintained in their full amplitude, thanks to the shifting winds, which are here deflected some to the north, some to the south, so that but little rain or snow falls along their normal track. Farther south a fresh contrast corresponds with a fresh change in the course of the aerial currents. Here the system is reduced to a single range flanked at most with a few small parallel ridges; it is intersected by deep gorges and passes cut through the heart of the rocks, and is at last entirely broken by the Strait of Magellan. Water was the agent by which the highlands have thus been carved, hollowed out, and in places quite eaten away by the copious rains accompanying the oceanic winds.

At a former time, when the coast valleys were still filled with ice, glaciers also contributed to modify the seaboard by preventing the deposit of alluvial matter, and carrying seawards the detritus of all kinds.

CLIMATE.

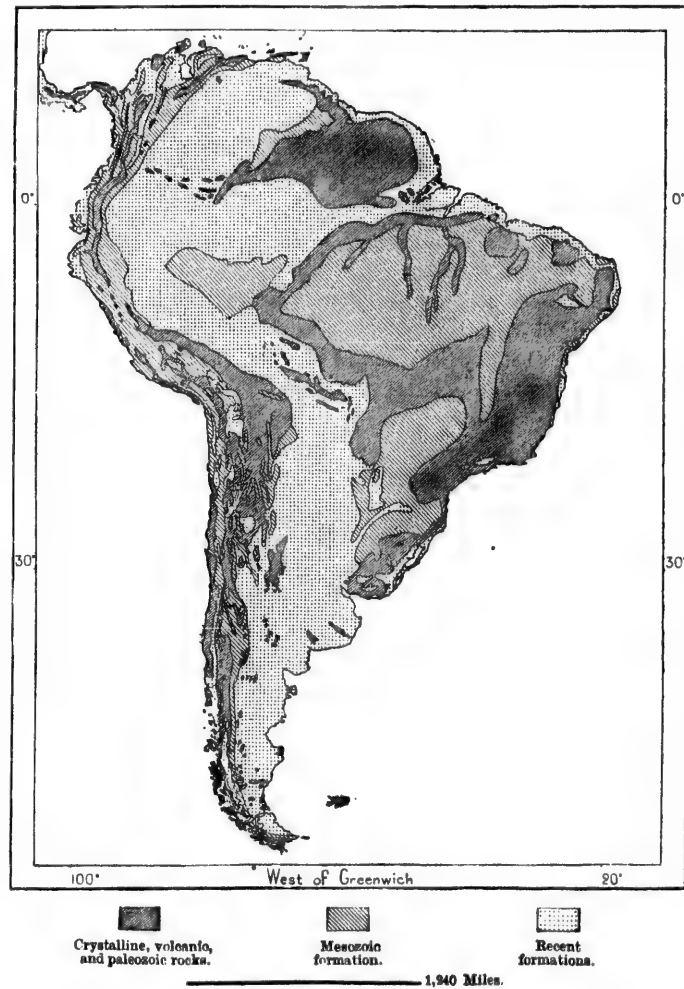
Taken as a whole, the South American continent enjoys a far more moderate climate than the division of the globe on the opposite side of the Atlantic. Its superiority in this respect must be attributed to the difference in the form of the two continental masses. South America being much narrower, the moderating influence of the surrounding marine waters is more easily felt far inland. Moreover, the western continent is largely exposed to the action of the trade winds which sweep up the broad valleys of the Orinoco and Amazons. In Africa, on the contrary, the most elevated coast ranges are disposed along the shores of the Indian Ocean, and thus intercept the winds blowing from the rainy quarter. The northern section of this continent also lies to leeward of the huge mass of lands formed by Europe and the whole of Asia. Thus it happens that the north-east polar winds passing over Turkestan, Persia, and Syria arrive almost completely deprived of moisture, and under their dry breath the summer heats become oppressive.

In South America the line of greatest heat, which nearly coincides with the seaboard between the Gulf of Uraba and Cape São Roque, scarcely represents an average of more than 80° or 82° Fahr., whereas in Africa the corresponding isothermal traverses a zone where the normal temperature exceeds 86° Fahr., and where the heat is tempered by no sea breezes, as it is on the Colombian and Venezuelan coastlands.

On the other hand, the southern section of South America may be regarded as lying within a cold zone, where the thermometer falls to 41° or even 39° Fahr. on the plains, standing at a slight elevation above sea-level. On the coast ranges the temperature, falling with the altitude, soon reaches freezing point. In this

Fig. 9.—MAIN GEOLOGICAL DIVISIONS OF SOUTH AMERICA.

Scale 1 : 55,000,000.

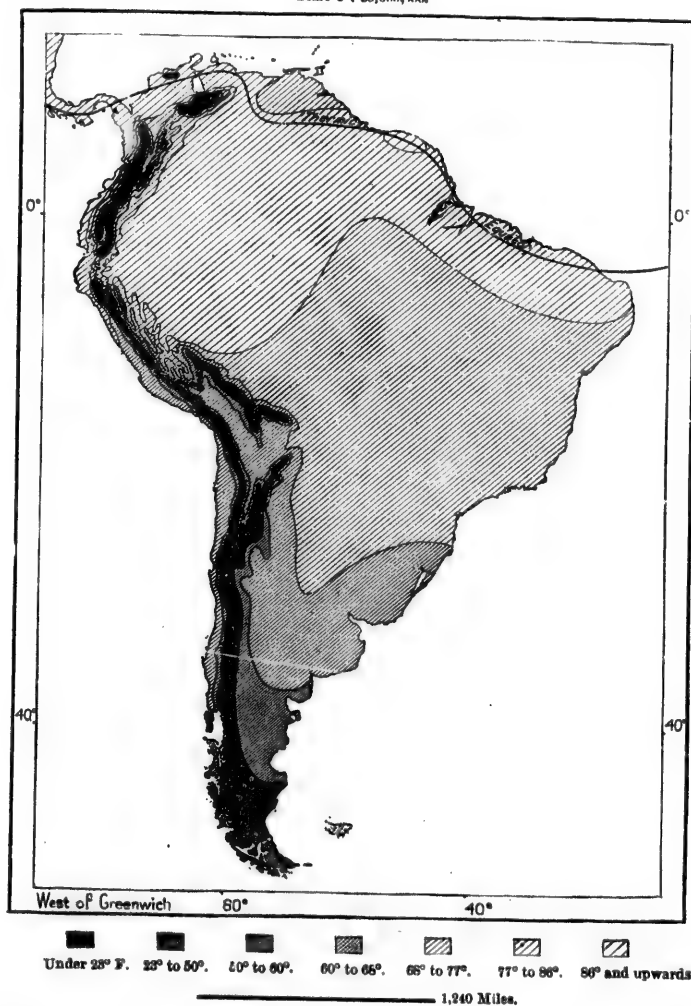


southern region the natural limit between the temperate and frigid zones is clearly indicated on the west side by the fjords indenting the Chilean seaboard. The sudden break in the uniformity of the coastline occurs a little north of 42° south latitude, at the Chacao passage separating the island of Chiloe from the mainland.

In the northern hemisphere the zone of fjords, representing the work of ancient glaciers, is shifted nearly 430 miles farther from the equator, that is, to 48° north latitude, where the Strait of Juan de Fuca gives access to the great fjord known

Fig. 10.—ISOTHERMAL LINES OF SOUTH AMERICA.

Scale 1 : 55,000,000.



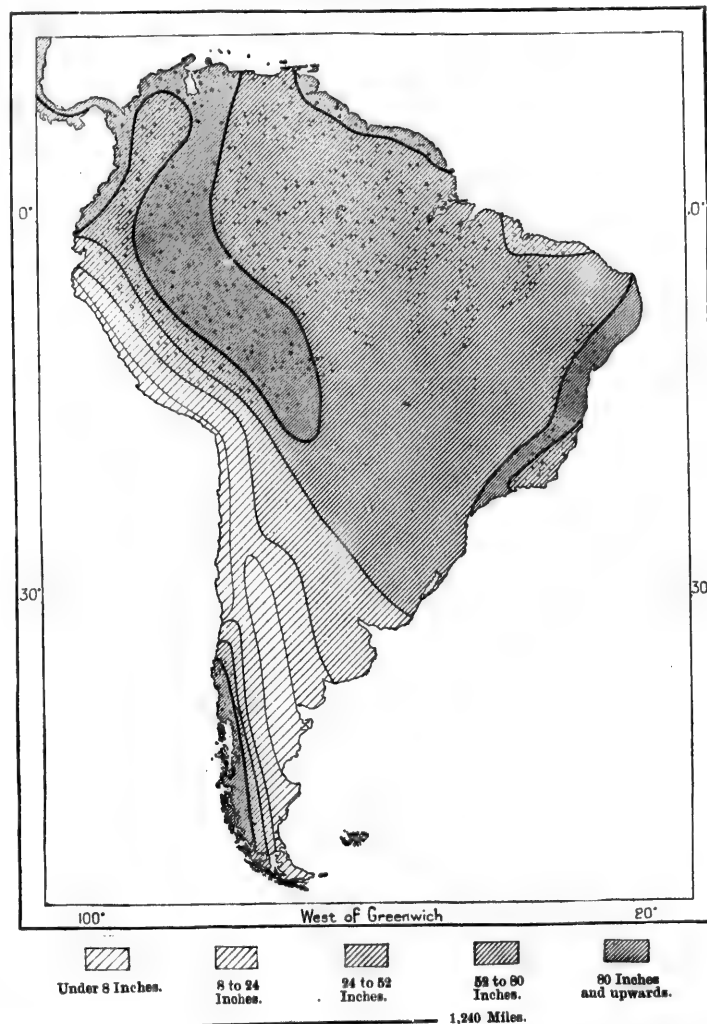
as Puget Sound. Thus South America, although its terminal point falls short of 56° south latitude, lies none the less, to some extent, well within the glacial zone.

Another factor contributing not a little to the cooling of the South American continent is the marine current which sets from the Antarctic regions straight for Tierra del Fuego, and which continues its northerly course along the west

coast of the mainland. In this respect the northern division of the New World is privileged. Under the latitudes of California and Oregon, which correspond to the Chilian and Magellanic archipelagoes, the seaboard is washed, not by a cold

Fig. 11.—DISTRIBUTION OF RAINFALL IN SOUTH AMERICA.

Scale 1 : 55,000,000.



current, but by the relatively tepid waters setting across the Pacific eastwards from the China and Japan seas.

It may be inferred from numerous geological phenomena that, at a more or less remote epoch, the climate of the Andes was far more humid than at present.

Old lacustrine basins, dry watercourses, and other indications of extremely energetic water action occur precisely on the western slopes where the work at present accomplished by the moisture, under the form of dews and rare showers, is insignificant compared with that produced by the changes of temperature. Noteworthy especially are the deep *quebradas*, or narrow gorges, excavated to depths of from 300 to 600 feet in the escarpments of the Peruvian plateaux. One asks in amazement, what downpours could have scored such tremendous furrows in the live rock? They are certainly not the work of the few showers which fall every thirty or forty years, as if by a miracle, in this now almost rainless region.

The hypothesis of a formerly moist climate is confirmed by the facts drawn from the domain of natural history. Various plants flourishing on the Ecuador and north Peruvian uplands reappear in South Chili, but are completely absent from the intervening arid Bolivian tablelands. So also with certain species of animals, such as the *Cervus antisensis* of the Peruvian Andes, which has been described by D'Orbigny and Tschudi, and which appears to be identical with the guermul or *Cervus chilensis* of the southern Andes and Magellanic lands. It occurs nowhere in North Chili, and the question arises, how has its range been severed in two? How does it happen that the same plants also occupy two distinct domains, one cold, the other hot, while avoiding the intermediate temperate zone? The explanation is that rain and atmospheric moisture are a necessary element in the evolution of these organisms. So long as the Andean plateaux were sufficiently watered, plants and animals roamed freely over the region at present occupied by the Atacama desert and neighbouring heights. But when the rains failed, a solution of continuity was effected between the northern and southern biological areas. In the heart of the Atacama desert, where nothing now sprouts except a few almost leafless stalks, the miner's pick often turns up the roots of large trees which formerly grew in forests on the now arid steppe.*

To the increasing dryness of the climate is also due the fact that the great Bolivian lake, Titicaca, has ceased to form part of the Amazons system. Formerly it sent its overflow to the Beni affluent, but it is no longer able to cross the parting line, and the slowly subsiding waters have left vast spaces unflooded. What remains of the old inland sea is nearly fresh, doubtless because the isolation of the lacustrine basin dates from a comparatively recent geographical epoch.

FLORA.

In the relative extent of its area under timber South America is surpassed by the Eastern Archipelago alone. Even Central Africa with its prodigious seas of verdure, which the Stanley expedition up the Aruwimi had so much difficulty in traversing, presents no such extensive space under continuous arboreal vegetation as the boundless woodlands of the Amazons basin and its affluents. These woodlands comprise also the whole of the Guiana seaboard, and are continued northwards by those of the Magdalena and Atrato valleys in Colombia.

With the exception of the interruptions caused by rocks, lakes, swamps, and

* Philippi; H. W. Bates, *Stanford's South America*.

rivers, the forest presents an unbroken surface in which human labour has hitherto made but a few isolated clearings. They are scarcely even traversed by any beaten tracks, except those made by the puma, tapir and peccary. Like the ocean, like the snowfields of the polar regions, the verdant seas covering tropical America seem to constitute a world apart, presenting an endless diversity of species, but of remarkable uniformity in its general aspect. The trees interlace their branches; trunks and foliage are bound together by the coils of the lianas, until the whole forms an inextricable tangle of vegetation, vibrating in long undulations with every breath of wind.

These continuous woodlands, which branch off southwards up the valleys of the Amazons affluents, are continued across the inland plateaux of Brazil by a less densely timbered region, in which the trees stand out with more distinct individuality, but which none the less constitutes an immense expanse of true forest, the *Matto Grosso*, or "Great Wood," as it is called by the Brazilians.

Still farther south follow the *catinas* and the *campos*, or "fields," that is, open spaces dotted over with *araucaria* thickets. These are succeeded in the southern parts of the La Plata basin by treeless plains, producing little but low plants, such as grasses and thistles. Here the arborescent vegetation is represented only by a few isolated trees, visible far and wide on the boundless plain. Such are the *pampas*, corresponding to the *llanos* north of the equator, that is, the open Venezuelan plains, everywhere encircled by the tropical forest zone. Less extensive than the *pampas*, the *llanos* are also less destitute of trees; in many places the heights, or even the simple rising grounds, are crowned with thickets or clumps of trees, resembling at a distance green islets in a shoreless sea. Here also the streams are lined with a fringe of leafy vegetation.

All these transitions from dense forests to more open woodlands, from groves and thickets to treeless savannas, correspond with the varying proportion of rainfall. The regions clothed by the Amazonian forests receive copious downpours nearly throughout the year, the dry season, as it is called, lasting less than three months. The absence of forest growths, as in the *llanos*, and in the districts of Guiana sheltered from the east winds by coast ranges, is due to the presence of a screen of mountains, by which the rain-bearing clouds are intercepted.

In *Matto Grosso* and the neighbouring provinces, where the dry season lasts more than three months, the moisture is insufficient to nourish an exuberant vegetation such as that of the Amazonian woodlands. It diminishes in the region of the Brazilian *campos*, and still more in the *pampas* of Argentina. Lastly, the few deserts of South America, also called "*pampas*," the sands of Tumbes and of Sechura in north Peru, the Pampa de Tamarugal, the Atacama desert in the territories recently annexed to Chili, all owe their lack of vegetation to the almost total absence of rain.

The southern extremity of the continent is too far removed from the Antarctic Pole for the temperature to destroy the forest vegetation. But the

same effect is produced by the altitude of the mountains. Numerous summits, and, in fact, all the Cordilleras taken as a whole, rise in the cold atmospheric regions above the forest zone. As a rule, the upper limit of this zone lies at

Fig. 12.—DRUDE'S MAIN BOTANICAL DIVISIONS OF SOUTH AMERICA.

Scale 1 : 57,000,000.



about 3,000 feet below the snow-line. Under the equator and in Bolivia forests still reach an elevation of 11,500 feet on the flanks of the mountains. But above them plants of low growth range right up to the edge of the snows, and even higher in those spaces where the snows have been cleared by the winds

or the solar heat. Boussingault found a saxifrage growing at a height of 15,770 feet on Chimborazo, while mosses and lichens have been gathered on the same mountain at altitudes of 16,500, 17,000, and even 17,350 feet.

On the slopes of the mountains and along the main ranges the different floras follow in succession one above the other—at their base tropical plants, higher up those of the temperate zone, and towards the summits an alpine or glacial vegetation. Thus the Andes and the other South American highlands contribute by their superimposed climates to the great variety of species characteristic of this continent. In Europe, where most of the ranges are disposed in the direction from east to west, the various vegetable forms spread freely in the same direction from one end of the continent to the other. But not so in South America, where the plants of the east are abruptly arrested by the barrier of the Cordilleras, while on the opposite side, even under the same latitude, other forms have been developed, analogous, but still distinct enough to constitute an independent flora.

Lastly, the oceanic archipelagoes of the Galapagos and Juan Fernandez are distinguished amongst all marine lands for the original character of their floras, forming in this respect little worlds apart.

By keeping in view the chief contrasts between the floras diversely intermingled at the points of transition from zone to zone, South America may be divided into eight great botanical domains, to which must be added the archipelagoes, as forming so many different provinces. The Falkland Islands, however, resemble Tierra del Fuego in their herbaceous and scrubby growths, and in the general aspect of their vegetation.

According to O. Drude* the eight divisions are as under:—

Tropical Zone.—1. Evergreen virgin forests; rains throughout the year, or for not less than nine months.

2. Forests and savannas intermingled; dry season of over three months.

3. Tropical flora of the uplands.

Temperate Zone.—4. Evergreen forests with palms and pines; summer rains from December to March.

5. Evergreen shrubs; few or no trees; no palms; winter rains.

6. Evergreen trees, with deciduous leaves; bush; pine forests; no palms; rains throughout the year.

7. Prairies, steppes, and deserts; great variations of temperature; slight rainfall.

Frigid Zone in the south and on the uplands.—8. Impoverished arborescent vegetation.

Thanks to its extremely diversified flora, South America has, during the last four centuries, given to the civilised world more plants useful for alimentary, medicinal, and industrial purposes than any other division of the globe. The potato, which has become the staple food of so many millions of human beings, is of South American origin, growing wild at various altitudes in the region of the

* Berghaus's *Physikalischer Atlas*.

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CEIBA TREES NEAR BOLIVAR, VENEZUELA.

Andes from Colombia to Chili. Manioc and yams, even more indispensable to certain negro and West Indian populations of Latin America than the potato can ever be to the Germans and Irish, are also indigenous in the southern section of the New World. From the same region also come a species of bean, the tomato, the ground-nut, cacao *theobroma* ("food of the gods"), the pineapple, guava, chirimoya, and many other fruits now flourishing in the tropical zone of the Old World.

Sooner or later South America will supply the gardens of Europe with other economic plants not yet acclimatised, such as the quinoa, a species of chenopodium, whose seeds when ground yield a kind of bread; the arracacha root, which resembles celery; maté ("Paraguay tea"), which takes the place of tea in Argentina and South Brazil; perhaps, also, the ceiba (cheese-tree), which attains a great size in the Bolivar district, Venezuela. The industries have received from South America the sap of various rubber plants; and medicine is indebted to it for, amongst other products, such drugs as ipecacuanha; tolu balm; cinchona, which dispels fevers; and the coca leaf, which allays pain and the pangs of hunger.

In return the South American continent has been enriched by nearly all the alimentary and industrial species of Europe and Asia. The banana spread so rapidly in the hot regions that most naturalists supposed it to be indigenous; it was introduced into the New World by the now almost forgotten bishop, Thomas de Berlanga, the same benefactor of his kind to whom we owe the discovery of the Galapagos Islands.* Unfortunately, with the useful species came also the weeds of the Eastern Hemisphere. On the elevated plain of Bogota, as well as on the surrounding slopes, the foxglove (*digitalis purpurea*) thrives vigorously.

FAUNA.

The fauna of the South American mainland is of a very distinct character. In this relatively isolated division of the globe the animal forms have necessarily diverged from the types prevailing elsewhere. But there survive none of the huge beasts of former epochs, such as the "mastodon of the Andes" whose remains are found in the gravels of the Chilean lacustrine formations. Hence South America has no longer any animals comparable in size to the Asiatic or African elephant, the giraffe, hippopotamus, or rhinoceros, the tapir being, in fact, the largest of all its mammals. There are, however, long-tailed apes, differing greatly from the anthropoids of the Old World, and from the lemurs of Madagascar.

The forests are infested by carnivora of the feline and canine families, by bears, martins, otters, and weasels, while the order of bats is represented by numerous species, including the blood-sucking vampire. South America has no camels, which are here replaced by the analogous but smaller llamas and vicuñas of the Andes. Various forms of marsupials range the whole continent as far south as the southern Argentine states and Patagonia. The avifauna has received an enormous development, containing no less than 2,300 species; and the fishes of

* Marcos Jimenez de la Espada, *Boletin de la Sociedad Geografica de Madrid*, 1891.

the inland streams and surrounding marine waters are even still more numerous. The manatee, one of the marine mammals frequenting the coast, penetrates far up the Amazons and its great affluents, and although actively pursued by the fishermen, it here maintains itself in scattered groups.

As has been shrewdly remarked by the learned zoologist, Jimenez de la Espada, the vast forests of the Amazons basin must have tended to modify in a uniform manner the habits, and consequently the organic structure itself, of all the animal species. The inextricable thickets of underwood, often flooded, and always pervaded by a heavy, stifling atmosphere, impede the free movement of mammals and even the flight of birds. Many forms which elsewhere live on the ground or fly low are here of arboreal habits, hopping or sitting from branch to branch amid the dense foliage of lofty trees. While all is still and silent in the low undergrowths, the leafy boughs struggling upwards to the light are alive with the songs and cries of their denizens. Here is the true life of the forest. The more majestic trees, such as the ceiba, are nearly always of solitary growth.

Despite the short period that has elapsed since their introduction, the domestic animals imported from Europe have already been modified by the changed environment. New breeds of horses have been developed, especially in the Argentine pampas and Venezuelan llanos. Here this animal had till lately increased prodigiously, as if striving to equal the multitudes of equidæ which roamed these plains in a former geological epoch. Throughout nearly half of the continent the horse had returned to the wild state, as had also the pig and horned cattle. Of dogs there still survive one or more of the old native breeds, one of which had been tamed by the Incas. The wild Indians of the Antis family also possess a species of black-and-white colour, long body and low intelligence, which hunts like our greyhounds. There is also the Fuegian dog, which resembles both the jackal and the fox. The American breeds have almost everywhere been crossed, and the more or less mixed European varieties are now everywhere dominant.

IV.

INHABITANTS OF SOUTH AMERICA.

The South American Indians—Peruvians or Caribs, Botocudos, Araucanians or Patagonians—are less famed in history than some of the North American nations, such as the Hurons and Iroquois. Thanks to the fascinating novels of Fenimore Cooper, the single Algonquian tribe of the Mohicans is more frequently mentioned than the most renowned aboriginal people of the southern continent. The expression "redskins," applied to the natives by the New England and Canadian settlers, has been too frequently used to designate all the indigenous populations of the New World, although scarcely applicable at all to those of the south.

But a sort of pre-eminence was conceded to the northern aborigines, as if they were in a superlative sense the typical branch of the American ethnical family. Yet the South American natives, whether of light or dark complexion, far outnumber those of the north. Some of their cultured nations, also, were at least fully as

civilised as the Aztecs and the other more advanced peoples of the Mexican plateau. Moreover, the Indians of Latin America, including these Mexicans themselves, have displayed more vitality, more power of resisting the destructive forces than the redskins properly so called. While the latter have either disappeared, or been for the most part swept into "reserves," the former still constitute the substratum of the population in the land of their forefathers.

THE ABORIGINES.

All sixteenth-century chronicles are unanimous in asserting that the southern continent was thickly peopled at the time when the Conquistadores penetrated into the interior of the New World. Doubtless the leaders of the Spanish bands who carved their way through empires sword in hand often sought to enhance their glory by exaggerating the multitudes they had butchered. But apart from the vapourings of these ruthless adventurers, many a spontaneous remark, many a detail incidentally mentioned in the reports shows that the inhabitants were really numerous.

Authentic witnesses speak of whole districts, of spacious valleys, of vast plateaux where the natives were crowded together in towns and villages, but which a hundred years after the arrival of the whites had become complete solitudes. At the present time the heaps of refuse still found after three centuries on the plains of the Peruvian seaboard, as well as on the mountain slopes, the so-called *andenes*, or sustaining walls, following like flights of gigantic steps up the sides of the hills, recall the terraces of tilled lands which encircled the mountains as with wreaths of green crops.

A century after the Pacific slope had been wasted by the Spanish invaders, when the missionaries descended the opposite side into the Amazonian valleys, there also they found the land occupied by numerous tribes. One of them having asked a chief of the Jeberos how many nations dwelt in the forest regions round about, he replied, taking a handful of sand and throwing it into the air, "Countless as these grains of dust are the nations of this country. Not a lake, not a river, not a hill or a valley, not a plain or a forest but is filled with inhabitants."

Unquestionably millions of human beings perished through wanton cruelties, and especially by the forced labour imposed on the natives, who were literally worked to death. Their employment under the lash of the overseer in the mines and on the burning soil of the plantations; no doubt, also, the crushing burdens and weary marches of these "pack animals" along the rough mountain tracks, resulted in the rapid disappearance of nearly all those whom the conquest had delivered into the hands of white employers. Doubtless many tribes were able to avoid oppression by taking refuge in the mountains or the forests; but they were unable to escape the fearful mortality caused by the epidemics following in the wake of the invaders. Thus, in the seventeenth century a great part of the natives perished in the upland Amazonian valleys. Here the only resident whites were the missionaries, who strove to gather the Indians around them in peaceful communities; but by inducing their flocks to change their habits of life, they made

them the more susceptible to the ravages of disease. Whole populations were destroyed by small-pox, and in districts once occupied by flourishing villages, nothing is now seen except a few survivors encamped in the forest glades.

At the time of the great mortality following the conquest it was supposed that the aborigines were destined to disappear on the mainland, as they had already disappeared in Española and the other West Indian islands. Even long afterwards their ultimate extinction continued to be regarded as inevitable. But history has fortunately proved the contrary. After the period of decline the natives, transformed by crossings with the whites, are again increasing, if not everywhere, at least amongst their more important groups. Compared with the other great representative races of the world, they are advancing even at a more rapid rate than the whites, but they no longer advance as a distinct race. Henceforth the descendants of conquered and conquerors are merged in a single nationality.

Viewed as a whole, the southern aborigines are distinguished from those of the Laurentian and Mississippi regions by the colour of their skin, which is not coppery red, but presents, according to place and race, two distinct tints, olive-brown and yellow, with all the intermediate shades. Neglecting the minor groups, brown may be said in a general way to prevail amongst the natives of the Andes, yellow amongst those of the plains and of the Guiana and Brazilian uplands.*

To what is to be attributed this difference in the complexion of the two main divisions of the aborigines? Probably to more than one cause. The contrasts of climates, of pursuits, of habits, of food, all contribute in various degrees to produce contrasts in the colour of the skin. It must be especially borne in mind that the natives of the western slopes of the Andes live under a dry climate, or at least one far less moist than that of the eastern regions, that they are for the most part agriculturists, and that their diet is chiefly vegetarian. The hunting and fishing tribes of the plains are, on the contrary, far more carnivorous.

Differences occur in the shape of the skull, and in the stature, although the comparative tables of these discrepancies do not supply sufficient materials for a definite classification of the Indians based on racial characteristics.† While differing in many other respects, all the natives resemble each other in the quality of their hair, which is coarse, black, and lank, in their scanty beard, short chin, small, deep-sunk eyes, powerful jaws, and fine teeth. Physical deformity is extremely rare, which should be attributed to the perfect freedom of movement left to the children, nearly all of whom are allowed to run about naked.

Certain writers of the last century, notably Ulloa, who had, nevertheless,

* A. d'Orbigny, *L'Homme Américain*.

† Cephalic index of the South American aborigines, according to Hyades and Deniker:—

Extreme brachycephaly: Patagonians	85
Extreme dolichocephaly: Coroados of South Brazil	70

Stature:—

Highest: Patagonians, according to A. d'Orbigny	(mean) 5 ft. 10 ins.
Shortest: Galibi, according to Deniker	(mean) 5 ft. 2 ins.

visited the New World, but who had in view chiefly the morose and gloomy Quichuas of Ecuador, denied all intelligence to the South American aborigines. "They have neither discretion nor understanding"; they are "animals," "brutes," and so on. So also many settlers in Brazil called them *bichos do mato*, "beasts of the forest." But such expressions reflect chiefly on those who utter them. The fact is, these natives, like all other human races, share in our strength and our weakness, possess in various degrees our intellectual and moral faculties, rise to the performance of great deeds, and relapse into degrading practices, advance or recede according to the struggles in which they are engaged, the environment in which they dwell, the degree of liberty which they enjoy.

Several South American nations, such as the Muyscas, Quichuas, Aymaras, and other Andean races, made sufficient progress to entitle their social system to be called "civilised." They had acquired the arts of husbandry; they were able to make earthenware, to weave textiles, to work in copper, gold, and silver, to build edifices lasting for centuries, to carve statues, to embellish their vases and garments with artistic designs, to construct highways and bridges, and if not to write, at least to keep regular records by means of knotted strings.

Yet they lay under a heavy disadvantage compared with the peoples of the Old World. They possessed no domestic animals strong enough to supplement their own physical efforts. The extraordinary skill displayed by them in taming the beasts of the field gave them pets, but no fellow-workers. In this respect, they had nothing but the feeble llama and the dog to compare with the camel, the horse, the ass, ox, goat, and sheep possessed by the inhabitants of other continents.

The so-called wild tribes occupying the central and eastern forests have also their place in the history of human progress, and several of them have already begun to co-operate with the whites on a footing of equality. But the transition from one social state to another cannot be effected without profound disturbances. The hunting populations, who have succeeded in keeping aloof from the whites and mestizoes in the forests remote from the fluvial highways, or in their secluded upland valleys, have preserved their graceful carriage, their proud glance, and straightforward speech, whereas the enslaved peasantry tremble before their masters, bow their necks to the yoke, and carefully measure the words addressed with downcast eyes to their employers.

CHIEF DIVISIONS OF THE SOUTH AMERICAN ABORIGINES.

Thanks to the researches and linguistic studies of numerous intelligent observers, it has become possible to classify most of the aborigines according to their probable genetic descent, although difficulties are still presented by certain tribes remote from the bulk of their ethnical family. One of the best-defined groups is that of the Muyscas, or Chibchas, as they called themselves, who had formerly established their dominion on the Cundinamarca plateau, in the midst of numerous kindred tribes.

Farther south both slopes of the Ecuador and Peruvian Andes belonged to the great Quichua nation, followed in the present territory of Bolivia by the distantly connected Aymaras, ruder of manners, but of equally inoffensive

Fig. 13.—MAIN DIVISIONS OF THE SOUTH AMERICAN ABORIGINES.

Scale 1 : 60,000,000.



character. The southern extremity of the Cordilleras, with the dependent territories, formed the domain of the more warlike Araucanians.

In the eastern part of the continent the formerly powerful Carib (Caraib) race, till recently supposed to be extinct, because no longer found in the Antilles, are still represented by various tribal groups, reaching far into the interior of the Amazons basin. Intermingled with them are the Arawaks of the Upper Amazons and other districts. But in their long conflicts with hostile

peoples, these Arawaks have mostly been worsted, and many of them have been scattered over the Guiana coastlands, while the bulk of the race has been pressed westwards to the foot of the great mountains. Here they are associated with the Antis, who have given their name to the Cordillera of the "Andes," and who formerly occupied parts of the Andean plateaux, as well as the eastern valleys, where the southern Amazonian affluents have their source.

The Miranhas and related tribes are limited to the region comprised between the left bank of the Amazons and its two tributaries, the Iça and Rio Negro. On the opposite side of the great river, the Panos group is dominant on the Ucayali and Madeira, and the Carayas on the Xingu and Araguaya, affluents.

In the extreme east the Botocudos of the Brazilian coastlands are a branch of the Ges race, whose numerous tribes follow from north to south, from the banks of the Tocantins to those of the Parana. But of all the Brazilian families the most important, for the number of its tribes and the extent of territory occupied by them, is that of the Tupi or Guarani, who have given their language to most of the natives of the interior, and who have approached nearest to the whites in general culture. Conterminous with them on the upper Paraguay dwell the Guaycurus, and in the Rio de Janeiro district a few remnants of the Goytacas or Puri, while the Charruas of the La Plata region are now represented only by half-breeds. But the Indians of the Patagonian family still possess several full-blood groups, and Tierra del Fuego has also its distinct ethnical family, driven from the mainland to this insular extremity of the continent.

Instead of classifying the South American Indians by their linguistic affinities, D'Orbigny and others have attempted to group them according to their physical characteristics. They might also be classified according to certain usages, such as tattooing, circumcision, filing the teeth, artificial deformation of the skull, and especially cannibalism. But in the vicinity of the white settlements the study of the aborigines becomes more and more difficult, owing to the rapid changes going on in their social and political state, as well as in their habits of life.

Certain tribes have disappeared either by actual extinction or by absorption in others, while many can no longer be recognised, owing to displacements accompanied by change of names. But great migrations have not been numerous during the four centuries that have elapsed since the discovery. The natives have scarcely shifted their camping-grounds, except in those districts where the advent of the Europeans was for them the signal of inevitable doom. Nevertheless, all those who have failed to enter the Latinised social system of South America by the process of miscegenation, present a uniform spectacle of decadence, which has to be described in almost identical terms in dealing especially with those regions where their forefathers were dominant.

THE HALF-BREEDS.—MISCEGENATION.

Nowhere has the work of fusion between the various ethnical elements of the Old and New World made such progress as in the Andean regions. The

process may even be regarded as completed in all the more populous districts of Venezuela and Colombia, in certain parts of Peru, in north and central Chili, as well as in Uruguay and along the banks of the Plate river. On the other hand, nearly all the tribes of the eastern slopes of the Cordilleras, and in the great Amazonian forests, have preserved their social characters by keeping entirely aloof from the whites.

Farther east, on the Guiana and Brazilian seaboard, the populations of mixed origin again become dominant. But in these regions the process of miscegenation has taken place, not so much between the aborigines and the European settlers, as between the latter and the Africans, descendants of formerly imported slaves. In South America the strain of black blood increases in the direction from west to east, and the coloured element even greatly predominates in the Brazilian provinces which project nearest to the African continent. Full-blood families, whether white or black, are scarcely met at all along this eastern seaboard.

Besides the blending of the white type on the one hand with that of the Indians, on the other with that of the negroes, there occur, here and there, a limited number of half-breeds, the direct issue either of native men and African women, or of African men and native women. But as a rule the ethnical combinations are much more complex than such mixtures as these. During the course of the ten or twelve generations that have followed since the period of the conquest, the fusion of the various elements has assumed an endlessly diversified aspect. Although every individual half-breed may possibly be classified and denotated in a general way by his complexion and more salient features, the proportions vary beyond all calculation.

This ethnological problem is further complicated by the phenomena of atavism, in virtue of which the blends show a tendency to revert to one or other of the original types. The question of miscegenation, everywhere so difficult, should be studied especially in South America, where every town, village and hamlet in the neighbourhood of every tribe presents "specimens" of every conceivable variety. Attempts have been made to determine the comparative value of the results of such and such crossings. Thus, according to D'Orbigny, the issues of unions between different Indian races have always proved superior to either of the original types. So also the progeny of white men and Guarani women is distinguished by noble features and fine figures, nearly always of white colour from the outset, whereas Araucanian and Quichua mestizoes long preserve the characters of the native stock.

The fusion of negroes with Guarani women appears highly favourable for the physical improvement of the race. Other crossings are, on the contrary, regarded as baneful, resulting, as is asserted, both in bodily and moral degradation. But despite the facilities offered by the southern continent for the study of miscegenation, the subject is still involved in much obscurity. The fact, however, remains that, viewed as a whole, the population of South America is the most "human," representing the most complete fusion of the most characteristic primitive

elements—American Indian, African black, and white of Europe. Here is being physically developed the most representative race of the human species, taken in its entirety. In this respect what a contrast between this continent and North America, where the Anglo-Saxon race has kept mainly aloof both from the redskins and the blacks, thrusting them aside, and even exterminating them rather than sully their racial purity by contact with lower elements.

HISTORIC RETROSPECT—THE REVOLUTION.

For over two centuries after the prodigious and horrible romance of the Conquest, the South American populations may be said to have been overcome by a heavy social and political sleep. Under the system of bondage imposed by the Council of the Indies, tempered or aggravated at intervals by the caprice of the viceroys, the natives and even the settlers of European origin ceased to have any historic existence; all intercourse with aliens involved confiscation of property and capital punishment. As if by a sort of embryonic life, the movement of the American nations was carried on, no longer on the surface, but in the depths of society, where was accomplished the transformation of hostile races into a compact nationality. Spaniards and Quichuas, Portuguese, Africans and Guarani were preparing for their second birth as South Americans. But meanwhile silence reigned supreme, jealously guarded from interruption by their rulers. The submission of the aborigines seemed absolute, and a force of 2,000 men sufficed for the Spanish Government to maintain an atrociously despotic administration over those multitudes of enslaved peoples.

In such a vast region as South America, destitute of easy communications, and inhabited by peoples of diverse speech and origin, insurrections could not be organised for combined and sudden action. The partial and isolated struggles for independence were even necessarily attended and followed by reactionary movements. In Peru the first blow struck for emancipation, so far from being of a bold and resolute character, was, on the contrary, disguised under the form of a pretext for a "legitimist" restoration. In the revolt of 1780 the leader of the insurgents was a descendant of the Incas named Tupac Amaru, like the last sovereign of that race. But he was soon vanquished, and, like him also, perished on the gallows after the massacre of his followers.

The first Brazilian rising was inspired by a feeling of patriotism, its object being the expulsion of the Dutch from Pernambuco. After seven years of sanguinary conflicts it achieved its purpose, the insurgents storming the Batavian fortifications in the year 1634. Men of all Brazilian races, Indians, negroes and whites, had taken part in the struggle, and Fernandez Vieira, generally regarded as the hero of the war, was a mulatto. Later the negro slaves rose against their masters, and even founded in the interior a few independent republics, which enjoyed an ephemeral existence. Then came in 1798 the first attempt at political independence, led by Xavier, better known by the name of Tiradentes.

But the great South American revolution was heralded by a series of petty revolts, breaking out now in one place, now in another, all suppressed in their

turn, but only to reappear in ever-increasing numbers. Yet the movement would have been greatly retarded had not Europe itself been at that time in the throes of a political and social transformation. By upsetting the thrones of Spain and Portugal, Napoleon shook to its foundations the monarchical system in the New

Fig. 14.—SCENE OF THE WAR OF INDEPENDENCE IN SOUTH AMERICA.

Scale 1 : 60,000,000.



World. The removal of the traditional sovereigns, alone regarded as "legitimate," afforded a pretext for those eager for independence to mask their designs under the plea of allegiance to the old dynasties, and thus the insurrection broke out in all quarters under the disguise of loyalty to the legitimate rulers.

Gradually the various elements of local revolution, in one place the discontent of the Creoles at the appointment of Spanish or Portuguese functionaries, in another racial hatreds between whites, blacks, and Indians, elsewhere the struggles of "the masses against the classes"—all was merged in the tremendous conflict between the innovators and the representatives of the old conservative ideas. In this conflict everybody, yielding to his sympathies, his traditions or interests, took sides with the party with which his personal feelings were most in harmony. Thus it happened that in the two armies, whites found themselves arrayed against whites, blacks against blacks, aborigines against aborigines. And so the very war itself had the effect of welding the three races in a more intimate national unity.

On issuing from the struggle the old Spanish colonies had, under the influence of the French encyclopedists, constituted themselves republics based on the model of the United States, while Brazil, still hampered in its evolution by the great number of its slaves, was satisfied with a change of sovereigns; it ceased to be a colony to become an autonomous empire.

The community of interests binding all the Brazilian slave-owners together, and the national cohesion presented by the various groups of settlements along the coast and on the inland plateaux, enabled Brazil to preserve a state of almost unbroken public tranquillity for one or two generations. But in the Hispano-American states the relations were very different. In these regions, differing in climate, relief of the land, origin, speech and customs of its inhabitants, conflicting interests gave rise to incessant struggles. Hence the attempt proved hopeless to unite in a single commonwealth of vast dimensions the Andean highlands, the seaboard and inland plains, the torrid and temperate zones, the Pacific and Atlantic coastlands.

At first it had seemed natural enough to merge in a single political body the immense possessions formerly owned by Spain in the New World. In fact, from the purely geographical standpoint, South America is admirably suited to be occupied by a united people. While resembling Africa in its general outline, it differs altogether from that continent in its internal structure, and in the perfect harmony of all its parts. Most of the regions on the African seaboard are completely isolated one from the other by solitudes and, till recently, unexplored tracts, whereas the regions of South America abutting on the great backbone of the Cordilleras, and watered by tributaries of the same mainstreams, stand in a relation of close mutual dependence. They constitute collectively a geographical unit of a strikingly simple character.

But if the salient features of the continent and the disposition of its relief forecast political unity in a more or less remote future, the actual distribution of the populations in widely diffused groups, and unconnected by any common trading relations, necessarily tended to create independent centres of political life. Federal decentralisation, followed by complete separation of the several states, was brought about by the very force of circumstances in each of the new republics.

The vast trackless territory, where news of the last importance took months to spread, broke of itself into several sections. The union established at the outset had been nothing more than a league against the common enemy, and when the Spaniard disappeared, how many national quarrels still remained to be settled!—hereditary racial feuds between Antis and Aymaras, Araucanians and Quichuas, Charruas and Guarani, with which were perhaps secretly associated the rivalries of presidents, the thirst of territorial conquest. The old Indian names of cities have been gradually substituted for the Spanish designations, and statues of vanquished heroes of the land have been set up in the public places, sure indications of jealousies still smouldering between the foreign and aboriginal elements.

After the political emancipation, the ancient traditions of a government marked by a strongly centralised administration could not be at once reconciled with the process of dismemberment taking place spontaneously. All the old capitals—Bogota, Lima, Buenos Ayres—still wanted to retain their jurisdiction over remote provinces, and in the ensuing struggles the alternating fortunes of the battlefield gave the ascendancy now to one, now to another of the rival factions. The long and ruthless War of Independence, which covered the richest lands of South America with ruins, had also accustomed the eye to scenes of bloodshed and hardened the heart to the most savage atrocities.

The military enthusiasm stimulated by victory had also surrounded all the successful leaders with devoted adherents. Every ambitious captain was thus enabled to raise bands of armed followers to plunder a province, or, if the chances were favourable, to conquer a presidency. The love of strife entered into the marrow of the bone, and whole communities were found living in a chronic state of warfare. Social disorganisation was even promoted by the very abundance of material resources. Nothing was easier than to support an army of partisans on a conquered territory without any pay beyond the hope of pillage. Yet, although the South Americans have, so to say, passed their lives under fire, they have none the less made great strides in advance. The land has been gradually re-settled, the soil brought under cultivation, the local resources developed, while the substratum of the population has everywhere tended instinctively and incessantly towards national unity.

COMMUNICATIONS.

Nevertheless the South American continent can scarcely be said to have yet acquired that elementary unity by which it might hope to become a common fatherland for its diverse inhabitants. The means of transport between north and south, between east and west, are still so difficult that they are little used, except by daring travellers. The seaboard continues to be by far the most important region in respect of population, agriculture, and trade. Here are grouped nearly all the large cities, here is centred all commercial life. Meanwhile the inland regions remain comparatively stagnant, the growth of population being necessarily extremely slow in the sterile southern district of Patagonia, and in the tropical Amazons basin too exuberant to attract settlers.

From Bogota to Santiago of Chili, no one ever dreams of taking the direct route by the upland Andes valleys. Travellers have to turn first north to take ship for Colon, then cross the isthmus of Panama, and set sail on the broad Pacific in order to reach Chili, and so ultimately arrive at their destination. So also an inhabitant of Ecuador wishing to visit east Brazil will not follow the great watercourse which he sees flowing at his feet and descending straight to the Atlantic. He finds it more convenient to circumnavigate the continent either by the northern route by the Caribbean Sea, or by the south round Cape Horn or through Magellan Strait. To get from one point to another in South America many travellers save time and money by first crossing the Atlantic to Europe. The Brazilian proceeding to Colombia will gladly make Paris the chief stage on his roundabout voyage.

None of the unavoidable land journeys from the periphery to the central provinces can be called easy except those across the contracted southern extremity of the continent between Valparaiso and Buenos Ayres. Everywhere else the goal can be reached only at the cost of great hardships and even dangers, and with the loss of much time—weeks, or even months. Certain Brazilian and east Bolivian cities, although situated in civilised lands, are as inaccessible as many wild regions in Central Africa and Asia. The trip round the globe has become much easier than the journey from plain to plain across the parallel ranges of the Cordilleras.

THE SPANISH AND PORTUGUESE DOMAINS.

The natural dividing zone between the eastern and western sections of South America is indicated by the space almost exclusively occupied by aboriginal tribes, which is disposed in the direction from north to south along the foot of the Andes between the Orinoco and Parana affluents. This zone of separation between the regions inhabited by civilised man may also be regarded in a general way as the parting-line between Spanish and Portuguese America. The two unequal sections of the continent present a contrast in their distinctive features, which is all the more striking that the respective regions actually settled are still more remote, and have, so to say, no present points of contact.

In fact, to the existence of this intermediate neutral zone must be attributed the ease with which the Portuguese element has been able to expand westwards without encountering any serious obstacle on the part of the Spaniards. When Alexander VI., "slicing the world in two like an apple" (Oscar Peschel), shared it between the two conquering powers, Spain and Portugal, the latter state found itself endowed with a mere fragment of the present Brazil. But the very next year (1494) the Treaty of Tordesillas assigned it a much larger slice of the recently discovered continent. Even this frontier, however, was soon encroached upon by Brazilian adventurers, and especially by the intrepid "Paulistas," that is, the half-castes of the province of São Paulo, dwelling near the conventional parting-line. Such a frontier could, in fact, have been maintained only by a military cordon to defend it from encroachments. But at that time the Spanish

settlers, and even the missionaries, had crossed the crests of the Cordilleras only at a very few points, and could not dream of preventing the invasion of a territory of which they had no knowledge. Thus it was that Brazil, steadily moving west-

Fig. 15.—CONTINENTAL PARTING-LINES BETWEEN THE SPANISH AND PORTUGUESE DOMAINS.

Scale 1 : 60,000,000.



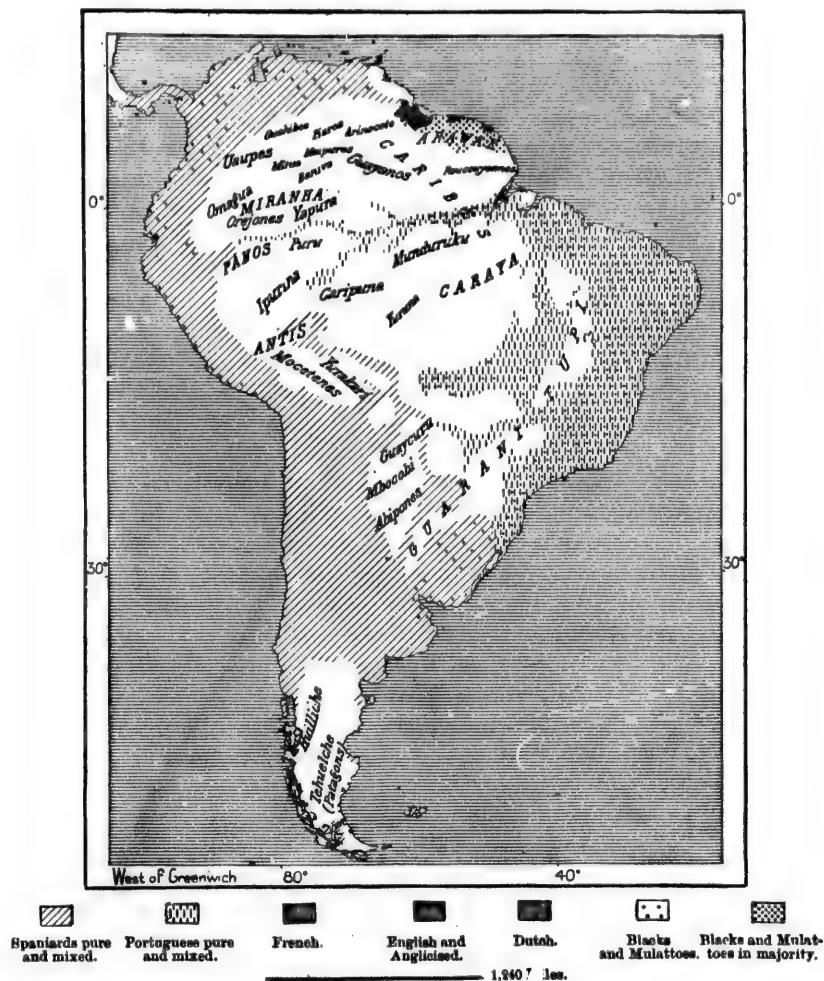
wards, gradually absorbed the whole of the natural region comprising the eastern foothills and the great wooded plains of the interior.

Occupying distinct geographical domains, Brazil and the Andean and Argentine republics have been historically developed on faintly parallel lines. Their populations, differing in speech as well as in their traditions and usages, have but a feeble sentiment of a common solidarity. Nevertheless, recent events, which

have replaced the imperial system in Brazil by a federal republic analogous to that of several Hispano-American states, will have the inevitable consequence of bringing the two groups of Latin populations into closer contact, especially in the

Fig. 16.—ETHNICAL DIVISIONS OF SOUTH AMERICA IN 1893.

Scale 1 : 50,000,000



La Plata basin, where Brazil is conterminous with Paraguay, Uruguay, and Argentina. Here a levelling process in social respects, and even in speech, is already in progress between the neighbouring populations.

But, despite all contrasts, South America remains as a whole the Latin continent in a pre-eminent sense. With the exception of Trinidad and Tobago,

Curaçao and neighbouring islets, British and Dutch Guianas, and the Falkland archipelago, the whole territory belongs to peoples of Romance speech, while the largest stream of immigrants directed to this region are Italians, the most direct heirs of Roman culture. Thus the ruling race in this part of the world presents a sort of balance, in its different character and natural genius, to the Anglo-Saxons dominant in North America from Labrador to the Rio Grande.

The Spanish and Portuguese Americans, yielding to the influences of French culture, and looking towards Paris as towards a metropolis, reflect French ideas in their literature, their fashions, and pastimes. Till recently the tie between the old Spanish colonies and the mother country had been almost completely severed in consequence of the rancour engendered by the War of Independence. Now, however, it has been again strengthened, thanks to their common origin and language; thanks also to the increasing tide of immigration, in which the Basque element has taken a large part.

In Brazil active relations have always been maintained with the old sovereign state, Portugal, having never been interrupted by any war. From Oporto and Lisbon crowds of Portuguese immigrants take passage for Bahia and Rio de Janeiro, although in recent years they have been outnumbered by settlers from the Italian peninsula.

FOREIGN RELATIONS.—RAILWAY PROJECTS.

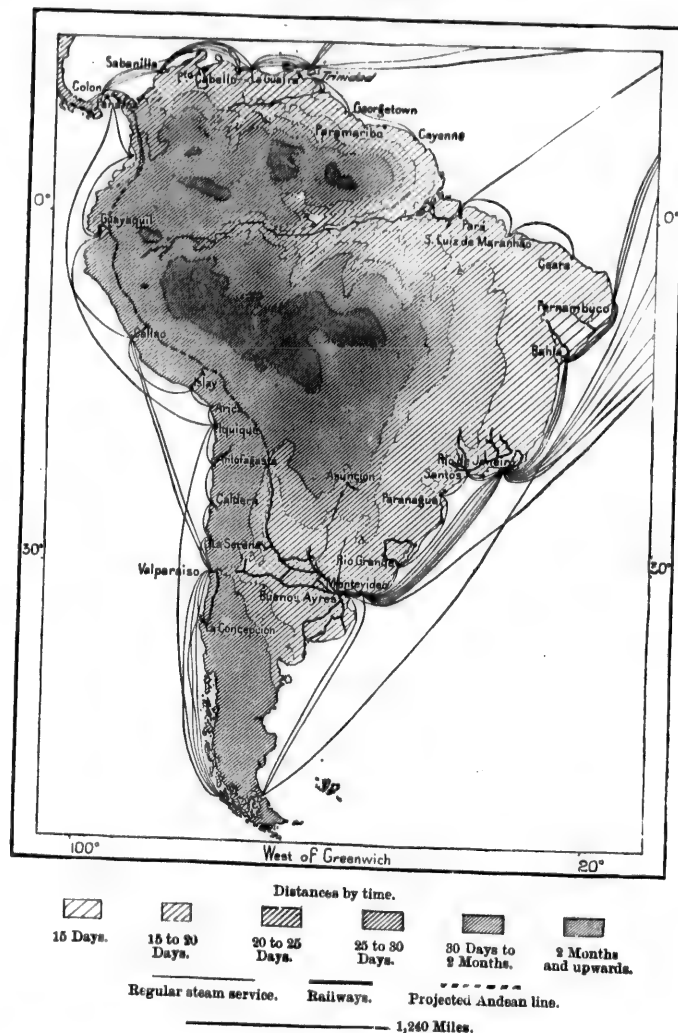
The share of Spain in the foreign trade of her old American colonies is relatively slight, far inferior to that of other nations, such as Great Britain, France, Germany, and the United States. On the Pacific seaboard the English, formerly excluded from all right of intercourse with the Spanish main, have now more than one half of all the exchanges. Hence, so far as regards its foreign trade, South America cannot be said to have preserved its character of a Latin continent. The settlers come from the Europe of Romance speech, while the merchandise is for the most part imported from the English-speaking world, Great Britain and the United States. These relations will probably continue until such time as the local industries may enable the Spanish and Portuguese republics to become independent of foreign manufacturers, or at least to give the first place to the inland trade between the conterminous states.

But were the projects of certain United States politicians to be realised, Latin Europe and even England would be completely excluded from all commercial dealings with the southern division of the New World. A skilfully arranged custom-house league, analogous to the German *Zollverein*, would place the consumers of South America completely in the hands of the producers of North America. With a view to developing these plans, the United States traders, supported by a "bureau" of the American republics installed at Washington, have already organised numerous lines of steamers to ply regularly between New York, Boston, Philadelphia, Baltimore, San Francisco, and all the more important points along the South American seaboard. New lines are yearly established, and at the Pan-American Congress of 1889 the delegates of the Southern republics were

assured that the communication between North and South would soon become still more frequent and rapid.

Nor is this all: although the sinuous form of the Central American isthmuses, their oblique disposition to the meridian, and the easy communications by water

Fig. 17.—ZONES OF DISTANCES BETWEEN LONDON OR PARIS AND SOUTH AMERICA.
Scale 1 : 80,000,000.



along both shores render absolutely useless a longitudinal railway between the volcanic plateaux of Guatemala and the Colombian forests of the Atrato valley, the United States Government has given countenance to the project of such a trunk

line, as being of the first importance for connecting in a single system the innumerable railroads of North America with the few that have hitherto been constructed in the southern continent. In Congress a chart was even exhibited showing tracings of the main lines which were, as if by enchantment, to bring into close proximity the great cities of the New World now separated by journeys of weeks or months. But since then little has been heard of these grand schemes, although partial surveys have been made of some of the sections.

According to these tracings, the first section of the southern trunk line would ascend the Cauca valley to Popayan, and run thence to Quito and Cuenca, and so on through the Upper Amazons valley to the Cerro de Pasco. From this point the route is continued towards Cuzco, descending to Jujuy after skirting the banks of Lake Titicaca and its emissary.

There is little doubt that this part of the project will eventually be realised, unless, indeed, the value of land routes as means of communication becomes suddenly minimised by some perfected scheme of navigation through the aerial spaces. Peru and Chili already possess some completed railways, forming important links in the future longitudinal line along the Pacific seaboard. From Rio de Janeiro and Buenos Ayres, also, dozens of branches are already diverging in the direction of those which are one day to descend the eastern slopes of the Andes towards the Atlantic.

The cordillera skirting the Pacific will serve to indicate the route to be followed by the great inter-continental trunk line, for all the chief cities are situated along its base, in its longitudinal valleys, and on its plateaux. The maritime routes on the Pacific side are also disposed in the direction of the meridian along the coast of South America, and parallel with the Andes. Except under the latitudes of Panama and of Magellan Strait, the boundless waste of waters stretching from the Andean region westwards to Australasia is rarely traversed by navigators. None of the oceanic regions within the temperate zones are more desolate.

SOCIAL CONDITION.—MATERIAL PROGRESS.—PROSPECTS.

Amongst diplomatists and politicians it was long customary to affect an air of contempt or of hopelessness in speaking of the Hispano-American republics; and this attitude seemed justified by the language of those South Americans themselves whom the vicissitudes of party politics had deprived of power and sent into exile. Having lost their fortunes or their prestige, they fancied that the country itself was lost. Even Bolivar, who had nevertheless grasped the highest honours before experiencing the ignominy of defeat, was said to be one of those who despaired of the fatherland, and reference has often been made to the words uttered by him on his dying bed: "Those who serve the revolution plough the deep."

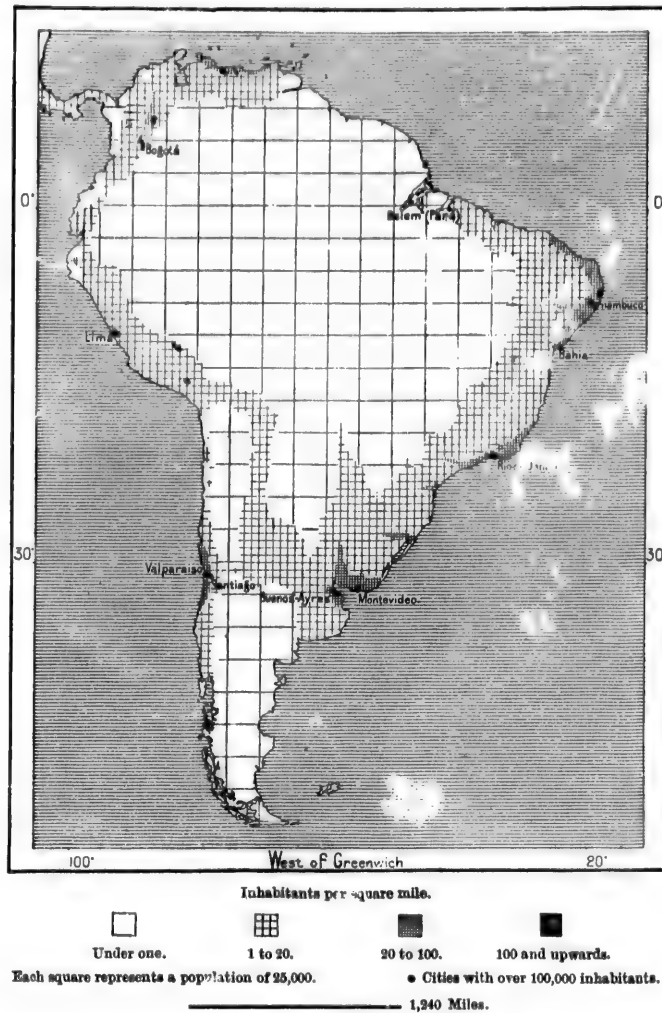
Nevertheless, if the present material and social condition of the South American populations be compared with what it was during the last years of the colonial system, it will be found that during the six or seven decades of political independence great progress has been made in population, wealth, and general education. The advancement in these respects has been relatively far greater than that of

many European nations during the same period. The official statistics are an eloquent reply to the pessimists.

Such has been the progressive development of the South American populations that some writers have already asked whether the Spanish tongue may not

Fig. 18.—DENSITY OF POPULATION IN SOUTH AMERICA.

Scale 1 : 60,000,000.



one day have some prospect of success in its rivalry with English for the ascendancy amongst the dominant languages of the world. The Spaniards of the New World, including the Mexicans, the Cubans, the inhabitants of Puerto Rico and of

Central America, already far outnumber those of the mother country. The Brazilians also are three times more numerous than the Portuguese, and with every year these discrepancies are widened to the advantage of the Ibero-Americans.

At present there are in Europe, in the Philippines, in Africa and America altogether about 62,000,000 who speak Spanish, or, at least, for whom Spanish is the language of culture. If the present rate of increase be maintained, if all the peoples placed under the control of the Hispano-Lusitanians accept this language, the communities of Spanish speech will be doubled by the year 1920; that is, in a century from the emancipation of the Hispano-American colonies, Spanish and Portuguese, which are near enough to be regarded as mere varieties of the same language, will be spoken by 180,000,000 human beings.*

The important part reserved in the near future for the language of Cervantes will also be justified, for the Hispano-Americans are continually contributing books of merit, occasionally even works of permanent value, to the common treasure of their literature. They have, moreover, the consciousness of their high destinies. Years have passed since the Argentine poet, Marmol, sang the future glory of his fellow-countrymen: "Ah! that I might be born again in those days of golden dreams! That it might be given to me to listen with softened spirit to the delightful symphony of thy future poets! But I hear them already! Poor exile that I now am, begging a country and freedom, I already see thy future glory, my mother!"

* Gabriel Carrasoo, *Boletín de la Sociedad de Geografía de Madrid*, 1891.





CHAPTER II.

ANTILLES OF THE VENEZUELAN SEABOARD.

I.—TOBAGO, TRINIDAD, MARGARITA, LEEWARD GROUP.



THE islands lying in proximity to the Venezuelan coast, and usually grouped with the Antilles, are not to be regarded as all belonging to the same formation. They are, in fact, of diverse origin, and Tobago, easternmost of the series and geographically harmonising best with the West Indies proper, is yet invisible from Grenada, the nearest member of that system. The two islands are also separated by great oceanic depths, while the waters shoal gradually from Tobago towards the mainland. This island is also disposed south-west and north-east, nearly in a line with the heights of Trinidad.

Trinidad itself is obviously a mere fragment detached from the continent by a disturbance of comparatively recent date in geological time. Margarita and neighbouring islets constitute, on the other hand, the remains of a mountain range which formerly ran parallel with the Cumana (Cariaco) peninsula. Lastly Tortuga, Curaçao and other western islands, sometimes collectively called the "Leeward Group," like the southern section of the Antilles proper, form another chain running with great regularity for a distance of 370 miles in the same direction as the first ranges of the Andes system in Venezuela.

Advantage was taken by the European naval powers of the position of these islands at some distance from the mainland to detach most of them from the Spanish main. Of the larger members of the group, Margarita alone remained in the possession of Spain, and thus passed to the State of Venezuela, together with the valueless islets and reefs of Coche, Cubagua, Tortuga, Los Testigos, Blanquilla, Orchilla, Los Roques, and Birds (Aves). But Tobago in the east and the neighbouring Trinidad, most important of all, were annexed to the vast colonial empire of Great Britain, while Curaçao, Buen Ayre, and Aruba in the extreme west still remain Dutch colonies.

II.—TOBAGO.

Tobago, as it is called by its English masters, projects in the form of a spear-head to the north-east of Trinidad. Its real name is *Tubaco*, a word which recalls

the kind of pipe in use at the time of Columbus amongst the Carib natives, smokers of *coliba* (tobacco). These Indians, being too weak to resist their powerful neighbours and hereditary foes, the Arawaks of Trinidad, were compelled, soon after the discovery of the New World, to take refuge in the island of St. Vincent. Here they became amalgamated with the older indigenous inhabitants, constituting with them the formidable people who were long regarded as the "Carib" nation in a pre-eminent sense.

Tobago, being thus completely deserted, was open to free European settlement, and in 1632 some traders of Flushing seized the opportunity to found the colony of Nieuwe Walcheren in the island. But even before their defensive works were completed, the Dutch intruders were surprised and massacred, or carried into bondage by the Spanish settlers in Trinidad, guided to the place by some Arawak Indians.

For some twenty years Tobago again became a solitude, serving only as a temporary station for fishermen and passing mariners. A seafarer wrecked on this island, uninhabited at the time, furnished Defoe with the chief materials for the history of Robinson Crusoe.

But the Dutch people of those times had far-seeing views and indomitable perseverance. In 1654 the brothers Lampsins, also Flushing traders, founded a new factory in Tobago; without, however, making it a political dependency of the home government. On the contrary, they gave it an international character, constituting it a port of call for merchants of all countries, English, French, and even Spaniards. Soon after a rival establishment was formed in another part of the island by some settlers from Courland, sent thither by James I. of England. But the Fichilingos (Pichilingos), as the Flushingers were called by the Spaniards, being wealthier and also reinforced by fresh arrivals, got the better of the Courlanders, and made themselves masters of the whole island. In order to enjoy their little domain in greater security, the head of the Lampsins family declared himself a vassal of Louis XIV. in 1662, and became "Baron de Tobago." Yet from this very suzerain came in 1677 the insane order to destroy the Dutch factories where some banished French Huguenots occupied a populous quarter, highly esteemed and beloved by the other colonists.

During the course of the eighteenth century the settlement of Tobago continued to make steady progress; but although the island was regarded as neutral, it ended by becoming English, thanks to the increasing number of British settlers, and in 1763 it was ceded by treaty to Great Britain. The change of political masters had for almost immediate consequence a corresponding change in the ownership of the land. The French proprietors were replaced by the later immigrants, the bulk of whom were "thirty-six-months Scotchmen," that is to say, colonists transported to the island by the planters free of charge in return for thirty-six months' unpaid service. By a formal order of the colonial assembly issued in 1793, the French were expelled from the island, and their property confiscated for the benefit of the great landowners.* Even still, despite the abolition of slavery, in consequence of

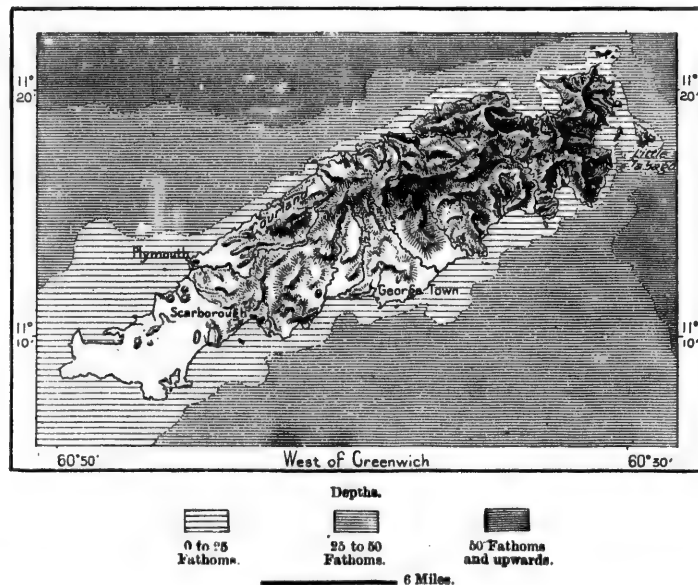
* J. J. Dauxion Lavaysse, *Voyage aux îles de Trinidad, de Tobago, &c.*

which in most of the islands the land has passed into the hands of the negroes, Tobago continues to be divided into large domains, occupied chiefly with the production of sugar.

The whole island may be regarded as forming a single chain of heights with a total area of less than 120 square miles. The highest eminence has a height of not more than 2,130 feet, or, according to the marine charts, a little over 1,900 feet.

In consequence of its oblique position to the meridian, Tobago lies well in the track of the trade winds, so that both shores, running south-west and north-east, enjoy the same purifying marine breezes. Both sides also have the advantage of some well-sheltered natural havens. The heights of the central district

Fig. 19.—TOBAGO.
Scale 1 : 470,000.



rising above the sugar plantations and the palm-groves along the seashore are still forest-clad. The more rocky escarpments are overgrown with thickets of the "pimento" myrtle, which yields the so-called "allspice," a berry of a highly agreeable aroma. The berry is eagerly devoured by swarms of parroquets, who form a sort of confederacy warding off all other birds from the thickets.

Like that of Trinidad the rich native flora is essentially South American, interspersed, however, with numerous plants from the West Indies. Its fauna also includes a few birds not found in the neighbouring island. One of the inlets on the coast was formerly known as the "Idlers' Cove," from the large number of turtles that resorted to the place to deposit their eggs. The inhabitants had only

to turn these animals over to obtain an abundance of food. But here as elsewhere turtles have become rare, and the struggle for existence has grown as intense as in most other places.

There are no longer any full-blood aborigines, who, according to Lavaysse, had been reduced in 1803 to three families, comprising altogether 26 souls. At present the great bulk of the population consists of blacks and people of colour, settled in the villages and on the plantations, which form a vast belt of gardens round the whole island. In 1871 the white population numbered only 120 persons. *Scarborough*, the capital, lies on an inlet of the south-west coast facing southwards. Although a mere hamlet, it is the centre of an export trade which in 1891 exceeded £24,000, and which before the fall of prices in the sugar market averaged £80,000 a year.

III.—TRINIDAD.

The *Yere* of the natives, re-named *Trinidad* by Columbus in 1498, in honour of the "three Persons united in one God," is one of the largest islands washed by the Caribbean waters, ranking in size next to Puerto Rico, whose almost geometrical outlines it faintly reproduces. Like Puerto Rico it has the form of a rectangle, which is compared by the Spaniards to an "oxhide" from the two peninsular appendices prolonging the north and south coasts in the direction of the mainland.

PHYSICAL FEATURES.

From the geological point of view Trinidad is a fragment of the Venezuelan region. The rim of rounded crests skirting its north side is continued on the continent by the Paria range, which in its turn reappears beyond the Cumana Gulf in the elevated chain separating the Caribbean Sea from the elevated plains of Caracas and Valencia. In the island and on the mainland the formations are everywhere the same, plutonic and metamorphic masses of a highly compact argillaceous schist, whose steeper escarpments face seawards. Despite the two breaks in the chain, at the Dragon's Mouth and the Gulf of Cumana, the axis of the system maintains its regular trend from Galera Point to Puerto Cabello, a total distance of about 500 miles, inclining but slightly from a line parallel with the equator. Beginning at the easternmost point of Trinidad under $10^{\circ} 50' 15''$ north latitude, the coast range crosses the 10th degree at the point where it is deflected south-westwards to merge in the general system of the Andes proper.

The break which occurs in the coast range between the Gulf of Paria and the Caribbean Sea is, moreover, studded with islands and islets representing the crests of submerged hills, which form a continuation of the north-west headland of Trinidad. The opening between the gulf and the open sea is thus decomposed into several channels, such as the Boca de los Monos, the Boca de los Huevos, the Boca de Navios and the Boca Grande. In this inlet, which represents the combined erosive action of the marine and Orinoco currents, the greatest depth in the main channel is about 150, and in the smaller passages 100 fathoms, while the

coast ranges vary in mean altitude from 1,500 to 3,000 feet. The two culminating points, Tucutche (Las Cuevas), in the middle of the cordillera, and the Cerro de Aripo in the north-east, attain the respective heights of 3,100 and 2,644 feet. The rugged crags of the Dragon's Mouth are over 650 feet high, one of them in Mono ("Monkey") Island rising to 1,000 feet. But even on the steepest slopes strewn with ruptured blocks, the bare rock is everywhere concealed by a leafy vegetation.

South of the chain of primitive rocks skirting the north side of Trinidad the plains and undulating tracts constituting most of the surface belong to the same cretaceous horizon as those facing the coast range along the Gulf of Cariaco, as well as those reappearing west of the Unare to the south of the Caracas coast range. The uniformity of the inland plains is broken only by Mount Tamana, a solitary mass 1,028 feet high, and mariners plying on the Gulf of Paria guide their course by the crest of Mount Naparima, which rises 590 feet above the water near the town of San Fernando.

Lastly, the south side of Trinidad, which, like the north, affects the aspect of a coast range, consists of dunes and tertiary rocks, as does also the chain of heights which, beyond the muddy banks deposited by the Orinoco and neighbouring streams, forms the northern edge of the llanos.

The south-western, like the north-western, peninsula terminating the Trinidad quadrilateral is continued towards the mainland by an islet, some reefs and the Soldado rock, which at a distance resembles a sail, and which is enveloped in a cloud of countless sea-fowl. Thus in all the elements constituting its framework Trinidad is essentially a part of the mainland. Even the shores of recent formation, by which its surface is increasing, are of continental origin. The sands and muds, which develop a convex curve on the east side washed by the Atlantic, have been brought down by the currents of the Amazons, of the Guiana rivers and the Orinoco. The channels of the Serpent's Mouth, giving access to the Gulf of Paria along the south side of the island, are no longer deep troughs like the northern channels of the Dragon's Mouth. They have already been partly filled in by the alluvial matter washed down with the Orinoco current. The yearly soundings show constantly varying results. Thus the east passage has shoaled from 8 to 4 fathoms, while in that of the west beyond the Soldado reefs the line everywhere reveals 12 or 13 fathoms; here the marine bed is incessantly scoured by a regular current.

GEOLOGICAL CHANGES.

Trinidad gives undoubted evidence of having undergone great geological revolutions. Erosions have taken place to a vast extent, as shown by the masses of quartz, containing some magnificent rock crystals, which are met on the plains, in the valleys, and on the hillsides. These are evidently the remains of old crystalline rocks, all the softer parts of which have disappeared, either changed to alluvia or carried away to the sea. Great beds of gravel or shingle 300 or 400 feet thick are seen at the southern entrance of all the valleys along the northern coast range. In a more northern zone, such, for instance, as Scandinavia, moraines would

certainly be found in this district. As it is, the detritus must be regarded as the debris of cliffs undermined by the marine waves beating against the foot of the hills raised by successive thrusts above sea-level.*

The central districts comprised between the northern and southern coast ranges present in the neighbourhood of the sea extensive expanses which were formerly marine inlets; now they are filled to a great depth with alluvial matter formed by the decomposition of mangroves and other plants. Possibly to the presence of this fluvial sediment is to be attributed the absence of continuous coralline formations on the coasts of Trinidad. Here and there, however, there occur a few coral reefs, fragments of which are strewn on the beach after every storm. The gradual subsidence of this part of the coast is placed beyond doubt by the numerous dead tree-stems on the beach, killed by the surging tide.†

Reference is often made to "volcanoes" in various parts of the island; but there exist only some groups of "mud volcanoes," one of which, towards the centre of the island, rises 135 feet above a morass called the "Lagon Bouffe" by the Creole negroes. Those of Cape Icacos at the south-west extremity, surrounded by swamps and fringes of mangroves, are conic hillocks, some mere molehills, others from 14 to 16 feet high. All are pierced by a terminal vent, whence escape periodical ejections of a whitish substance tasting like alum, and emitting an odour like that of sulphuretted hydrogen. The muddy waters bubbling up to the surface have no higher temperature than that of the surrounding atmosphere, although they at times eject shingle and lumps of sulphur with great force. According to the residents the Cape Icacos mud volcanoes utter bellows every year about the spring equinox, and at this period also are said to occur the eruptions of pebbles, accompanied by the uprooting of trees.

An old map indicates in the Gulf of Paria an islet which was said to have made its appearance simultaneously with a violent earthquake on the neighbouring mainland. In several parts of the south-western peninsula are seen beds of porcellanite, clays, and vitrified sands which have assumed the appearance of jasper. These beds, which are of no great thickness, and which occur in the midst of the quicksands, have evidently been exposed to the action of fire, like the slag of smelting furnaces, and they are supposed to have resulted from the burning of asphalts or lignites.

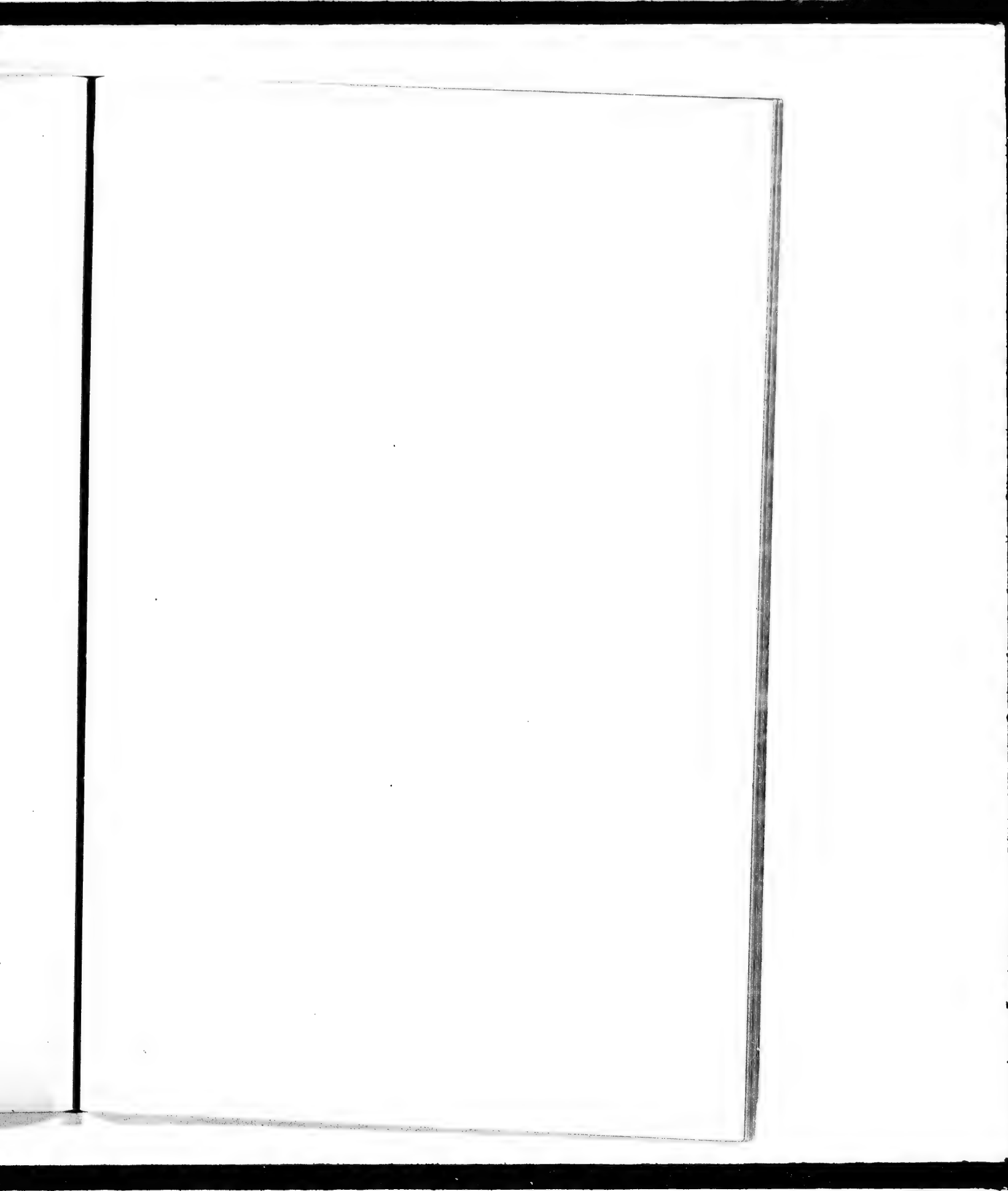
This part of the coast also appears to be in process of subsidence like that of the east side. Thus two forces acting in opposite directions are continually modifying the contour-lines of the island—that of the currents depositing sediment on the beach, and gravity or some other agent causing certain parts of the coast to sink.

THE ASPHALT LAKE.

In the same south-western peninsular district is also situated the "marvel" of the island, the so-called Brea, or Asphalt Lake, one of the greatest natural

* G. P. Wall and J. G. Sawkins, *Report on the Geology of Trinidad*.

† Charles Kingsley, *At Last, a Christmas in the West Indies*.





THE ASPHALT LAKE, TRINIDAD.

curiosities in the world. The basin, which occupies rather more than 100 acres on a slight rising ground about 85 feet above sea-level, usually presents the aspect of an exposed coalpit; but during the great heats the surface liquefies to a depth of about an inch. Even before the contents began to be worked for industrial purposes, the surface underwent frequent modifications; islands were formed and rapidly covered with agaves, wild pineapples and other vegetable growths; then they were swallowed up by the surging flood of pitch, to reappear on the circumference of some sluggish eddy in the viscous substance.

The underground forces acting on the asphalt cause it to rise in masses of unequal size, rounded off like huge toadstools and separated by narrow spaces filled with water at the normal temperature of the surrounding atmosphere, in which fishes disport themselves. The visitor may walk without any risk on the solid asphalt round the margin of these channels, although, according to the report of numerous travellers, the surface yields gently under the weight.

Towards the centre of the lake the bituminous substance is continually rising, mixed with sulphurous gases, and it often ejects logs of wood, branches or stems completely transformed by the saturating matter. The wood thus cast up always presents its pointed end to the air, so as at times to resemble rows of stakes. The pitch, which is very impure and consequently of small commercial value, contains from about one-fifth to one-third of earthy matter. The 78,000 tons exported in 1890 were valued at a little over £90,000.

The soil of the cultivated district encircling the lake is also charged with asphalt, yet is extremely fertile, yielding the best and finest fruits in the island. The pineapples especially are less fibrous, larger, more fragrant, and of a more golden colour than elsewhere. The very road leading from the lake to the neighbouring port of La Brea runs through a bed of pitch, and moves slowly seawards like a black glacier. The little houses erected along the track follow the same onward movement, so that they have to be periodically rebuilt. The shore also is fringed with bituminous reefs, and some 800 yards south of the headland a yawning chasm in the bed of the sea occasionally discharges boiling masses of petroleum, which rises and spreads out on the surface of the water.

Under about the same latitude, but in Mayaro Bay on the east side of the island, there occurs another submarine vent, whose eruptions, according to native report, take place with a certain regularity in the months of March and June every year, and are accompanied by a roar as of thunder, and apparently also by "flames." It is at all events certain that on these occasions the sea casts ashore lumps of hard, black and shining asphalt, which is collected by the inhabitants of the district. So long ago as 1805 it was manufactured by the English into a tar used for caulking purposes. According to Wall and Sawkins, the geologists who have most carefully studied this region, the asphalts both of the island and of the neighbouring mainland are derived from vegetable remains which, under temperate and polar climates, would assume the forms of turf and lignite.

RIVERS—CLIMATE.

Thanks to an abundant rainfall, Trinidad is watered by numerous streams which are navigable by small craft for a considerable distance from the coast. The Caroni, most frequented of these rivers, bears a Carib name, which recurs in various parts of the neighbouring continent. It flows nearly parallel with the north coast range, from which it receives its chief affluents, and falls into the Gulf of Paria, near Port of Spain; but during the floods a considerable portion of its waters are discharged laterally into riverine marshes. The Caroni is navigable by boats for about 24 miles, and it is proposed to connect this waterway with the Oropuche, on the eastern slope of the island, by means of a canal cut through the slightly elevated central waterparting.

The Guaracuaro, which falls into Naparima Bay on the south-west coast, develops a course symmetrical with that of the Caroni, while the Nariva (Mitan) and Guatara (Ortoir) have a common delta towards the middle of the east coast in the great curve extending from Galera Point to Galiota Point. Between the two mouths runs a channel protected from the surf by a fringe of mangroves. Numerous lagoons, the "lagons" of the French creoles, skirt the low-lying coast on both sides of the delta.

Lying entirely in the track of the trade winds, and being practically a part of the mainland, Trinidad escapes from the thousand vicissitudes of climate to which the Antilles proper are exposed. The seasons follow in the normal sequence, and during the *verano* ("spring") or dry season, lasting from November to the end of April, scarcely a drop of rain ever falls. The moisture collected on the surface is derived mainly from the heavy dews. But in the wet season, from May to October, storms are of almost daily occurrence. They are accompanied by sharp, heavy showers, coming on suddenly, especially in the afternoon, and never at night except a short time before dawn. Neither Trinidad nor its neighbour, Tobago, is ever visited by those terrific hurricanes by which Grenada, some 85 miles to the north-west, is frequently wasted.

FLORA—FAUNA.

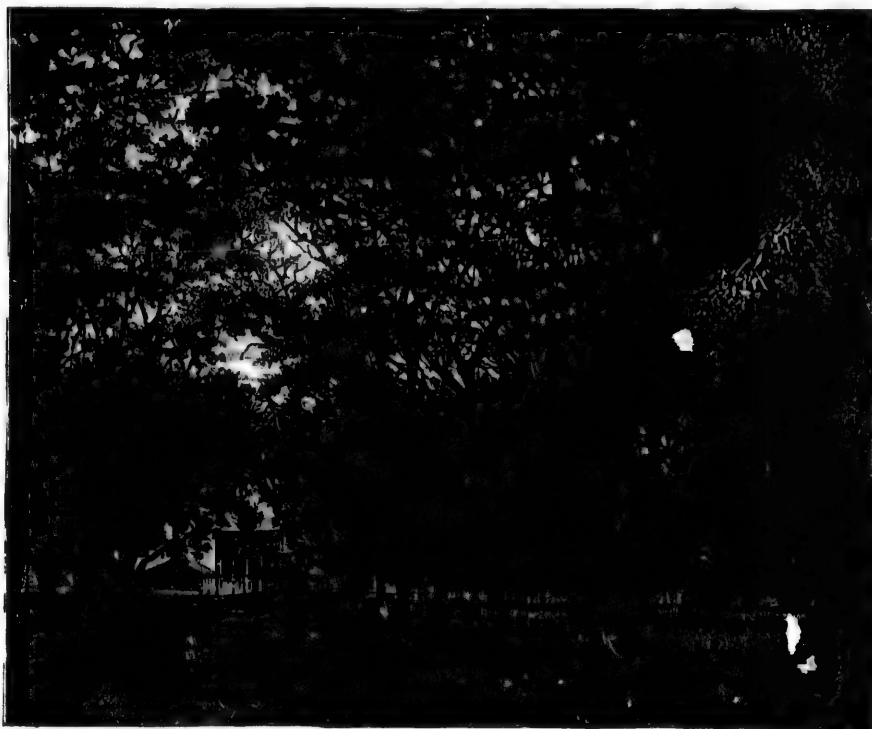
As in its geological structure and climate, Trinidad contrasts also with the Antilles proper in its flora and fauna. In their natural history both Trinidad and Tobago are mere dependencies of the South American continent. The former presents in its central part extensive tracts covered exclusively with grasses and plants of low growth in every respect similar to those of the Venezuelan llanos. They are savannas analogous to those traversed by the Orinoco and its affluents, and in the central parts of the island geologists, in fact, suspect the former presence of a great fluvial current.

But the treeless spaces are everywhere encircled by dense tropical woodlands, where flourish, in the closest proximity, nearly all the innumerable species belonging to the forests of Guiana. These multitudes of trees, lianas, and parasites of all kinds are amply fed by the yearly rainfall, which is estimated at nearly 80 inches.*

* Mean temperature of Port of Spain, 77° Fahr. Rainfall (mean of twenty-five years), 67 inches.

Botanists have not yet exhausted the study of the insular flora, which contains no less than 140 species of trees with bark possessing medicinal and especially febrifugal properties; timber and cabinet-woods are reckoned by the hundreds, nearly all of South American origin, although some West Indian and even African forms occur. Such is the *rhypsalis cassytha*, a cactus of Angolan origin, and the only member of this family found in the Old World. Amongst the forest giants special veneration is paid to the ceiba (*eriodendron anfractuosum*), which the negroes generally refuse to fell, regarding it as a magic tree. Anyone

Fig. 20.—VIEW TAKEN AT SAINT JAMES, PORT OF SPAIN, TRINIDAD.



bold enough to apply the axe to its roots without first propitiating it with a bottle of rum, would inevitably die within a year, and other calamities would overtake those throwing stones at it.

The palm family is represented by numerous species, amongst others the *oreodoxa*, some of whose stems exceed 150 feet in height; the timit (*manicaria*), whose leaves are used for thatching cabins; the *mauricarea aculeata*, the *desmoncus*, and others, armed with formidable thorns. According to a local tradition, a vessel freighted with coconuts from an island in the Orinoco delta was shipwrecked in 1730 on the east coast of Trinidad, where the nuts washed

ashore took root in favourable soil. Such is said to be the origin of the Cocal, a narrow belt of superb coconut-palms, which develops a crescent along the coast between Mancenillier and Guatara Points. The traveller passing from the virgin forests of the interior into the Cocal might fancy he had been suddenly transported, as if by magic, from the West Indies to the Laccadives, Maldives, or some other East Indian group.

Beneath these avenues of bending amber-coloured stems the beach is strewn with the trunks, branches, and leathery fruits of the timit, brought by the marine current from the Orinoco delta. The west coast, also, near Port of Spain and San Fernando, has been planted with the coconut-palm, which has the advantage of draining the soil. But while exotics are thus introduced, the primitive woodlands are recklessly destroyed, and extensive tracts have been already shorn of their leafy adornments. Hence the rivers also have become more irregular in their discharge, and less easily navigated.

Like the flora, the insular fauna is also mainly South American, and of equally varied character. According to the naturalist Léotaud, Trinidad possesses as many as three-fourths of the number of bird-forms found in all Europe. Unfortunately the blacks, all now provided with fowling-pieces, have already depopulated the greater part of the woodlands. Humming-birds, formerly very numerous, have nearly disappeared, shot in myriads to supply the demands of European fashion; as many as 15,000 a week were at one time forwarded by a single dealer. On the other hand, the farmyards abound with poultry, no climate apparently suiting the gallinaceous family better than that of Trinidad.

Amongst the extremely varied inhabitants of the surrounding waters several besides the shark are dangerous to bathers. Such is the *hydrocion*, which, though no bigger than the sardine, rushes in such numbers and with such ferocity on its prey that instant flight alone can save swimmers from being torn to pieces alive. Other species, which elsewhere serve as food for the coast peoples, are highly poisonous in the Trinidad waters. One of these, a species of shad (*clupea alosa*), is said to be so fatal that people have been known to be struck dead, as if by a stroke of lightning, before swallowing a whole mouthful.* One denizen of the Gulf of Paria emits musical notes, or buzzing sounds, like the maigres (*scixena aquila*) of the Mediterranean.

Trinidad was colonised by quadrupeds from the mainland before the opening of the Serpent's Mouth, which is of relatively recent origin. There are three species of simians, some small felines, a deer of extremely gentle disposition, and several other mammals. Kingsley tells us that epidemics of small-pox and cholera have been as fatal to the monkeys as to man himself.

INHABITANTS.

The only result of the first Spanish settlement, dating from the close of the sixteenth century, was to hasten the extermination of the aborigines. The Jayos (Yaos) and Nepoyos, members of the Arawak or Carib families, were

* Ch. Kingsley, *op. cit.*

formerly numerous; but they were hunted down and shipped as slaves to Española and other islands, to work in the mines or on the plantations. Soon the greater part of Trinidad was changed to a solitude, all the aborigines having perished, except a few small groups in the upland valleys of the north. In 1783, two hundred years after the Conquest, a census of the island returned only 2,032 Indians, and these had been reduced to 1,467 by the year 1807. At present a few families of these peaceful aborigines still survive in the neighbourhood of Arima, at the foot of the mountains, where they eke out a wretched existence by making baskets of reeds or foliage, and manufacturing other small articles. Even these are half-breeds crossed with Spaniards, and especially with runaway negroes. Till recently some naked Indians arrived once a year from the Orinoco delta, landed silently at San Fernando, and donning the slight costume required by the police regulations, passed through the town to make their annual collection of fruits and roots in the neighbouring forests. Then they returned as silently as when they arrived, re-embarked, and rapidly disappeared, paddling their canoes across the gulf towards the mainland.

The first Spanish settlers having been nearly exterminated by the English, French, Dutch, and Pichilingue corsairs, the island remained for about two centuries unoccupied, except by a few planters, who had established themselves on the west coast. In 1783 there were only 126 whites, and 605 black slaves or freedmen; including the Indians the whole population fell short of 3,000 souls. It was at this time that the adventurer, Roume de Saint-Laurent, a native of Grenada, succeeded in obtaining from the Madrid Government the repeal of the laws interdicting all foreigners from entering the Spanish possessions. Roman Catholics were even invited to settle in the island, the Government undertaking to protect them for five years against prosecution for any debts previously contracted. Roume de Saint-Laurent hastened forthwith to engage colonists in France and in the Antilles, and six years after the issue of the edict from Madrid the colony had already 2,150 whites and nearly 4,500 free people of colour, who had brought with them over 10,000 slaves.

Breaking with the national traditions of intolerance, Governor Chacon prevented the introduction of the Inquisition, and interdicted the establishment of monasteries. No settler was molested for his religious or philosophic opinions, and during the troubles at the close of the century the planters from the French islands were able to take refuge without let or hindrance in the Spanish colony. In 1787 Picot de Lapérouse erected the first sugar refinery, and ten years later there had sprung up 159 others, besides 300 "habitations," where coffee, cotton, and cacao were cultivated.

Since that time Trinidad has steadily increased in population and wealth, even during the wars which resulted in the British conquest. As in most of the Antilles, the bulk of the inhabitants are negroes and half-breeds, descendants, like their former owners, of immigrants from the other islands, and speaking the French creole patois. This is an extremely soft idiom of highly simplified

structure, though still possessing its own grammatical and euphonic laws. The Trinidad dialect, which has been studied by Thomas, a native of colour, possesses quite a literature, consisting, like the Martinique and Haiti varieties, especially of wise sayings and proverbs.

Nevertheless, there can be no doubt that in the near future the numerical preponderance will cease to belong to these French or Gallicised ethnical elements. A large number of extensive plantations and of the agricultural factories have

Fig. 21.—WIFE OF A RICH HINDU COOLIE.



already changed hands, having been purchased from their former owners by English and Scotch settlers. The latter have the reputation of being very grasping, as illustrated by the local expression, "Scotch friend," applied to the murderous lianas which entangle the trees in their deadly coils. Under analogous influences, negroes of English speech from Barbadoes and other islands are continually replacing the French blacks, and driving them to the interior. The latter, rejoicing in their emancipation, and naturally anxious to take advantage of

the changed relations, have nearly all abandoned the plantations, and now cultivate their own little plots, which yield enough for all their wants. There exist over 20,000 such small holdings, belonging, for the most part, to these Africans.

But the great landowners, deprived of the slaves who formerly garnered their crops, have had to replace them by hands procured through agents from the Far East. So early as the year 1800 some traders had already introduced from Macao about a hundred Chinese, amongst whom was a solitary woman; at present these "Celestials" are estimated at some 3,000, many of whom have in their turn abandoned the large plantations, and taken either to petty dealings or to cultivating small plots on their own account.

Since the year 1845 the imported labourers are nearly all Hindus, engaged directly by speculators, who are subsidised by the colonial government to the extent of about £80,000 a year. The coolies, almost exclusively from Bengal, are engaged according to the season, to the number of 2,000 or 3,000, for a term of five years, after which they have the right of a free passage home. All but 700 or 800 remain in the island, where they contribute with the negroes to increase the class of small freeholders. Some even return from their Asiatic homes, and settle in Trinidad with their families and friends. Thus the traveller may here recognise the natives as well as the scenery of India in the coconut-groves of the east and west coasts. The effect is heightened by the gay banners fluttering from tall bamboos to indicate from a distance the Hindu temples, where the devotees come to make their floral offerings.

The coolies, who at present form a third of the population, generally keep aloof, contracting no alliances either with the whites or the blacks. Nevertheless, there have already sprung up some fine types of Eurasians, a class daily acquiring an increasingly important position in Trinidad society.* The Sivaïtes, forming the majority of the Hindus, live on bad terms with the Mohammedans, and sanguinary conflicts have even taken place between the votaries of the rival religions. Nearly all their savings are spent by the coolies in the purchase of jewellery for their wives, which in case of divorce gives rise to much wrangling and lawsuits.

AGRICULTURAL RESOURCES.—TOPOGRAPHY.

In his work on the Orinoco regions, published in 1727, the Jesuit Gumilla informs his readers that the soil of Trinidad had been condemned to perpetual sterility ever since the first settlers had refused to pay the tithes. Nevertheless, the fecundity of the island has been amply vindicated by its white, black and yellow cultivators. Although scarcely one-eighth of the land has been reclaimed, the foreign trade, consisting chiefly of sugar, molasses and cacao, has long exceeded £4,000,000, while the local traffic in fruits, vegetables and other provisions is increasing still more rapidly.

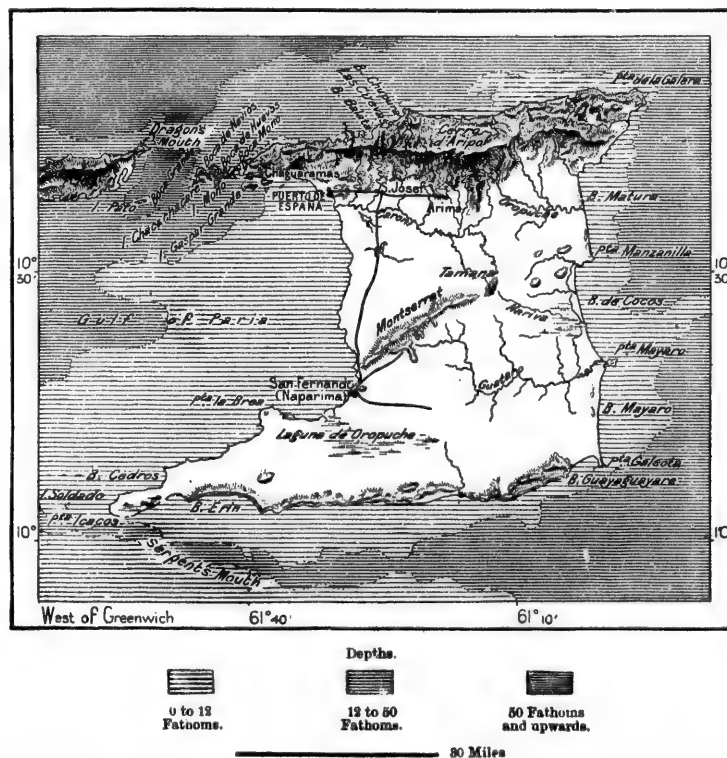
Nearly all the coffee-grounds have been abandoned, and tobacco also is now

* F. H. Hart, *Trinidad*.

but little grown, although the leaf is scarcely inferior to that of Cuba. One of the most costly operations on the plantations is the uprooting of the para-grass, which, although yielding an excellent fodder, grows with a vigour that threatens to stifle the more valuable sugar-cane. Most of the agricultural and commercial life of the island is centred on the west coast, where are situated the two largest towns, now connected by a railway and by a regular line of steamers. The east

Fig. 22.—TRINIDAD.

Scale 1 : 1,300,000.



side, facing the Atlantic and the trade winds, is almost a solitude destitute of towns or harbours.

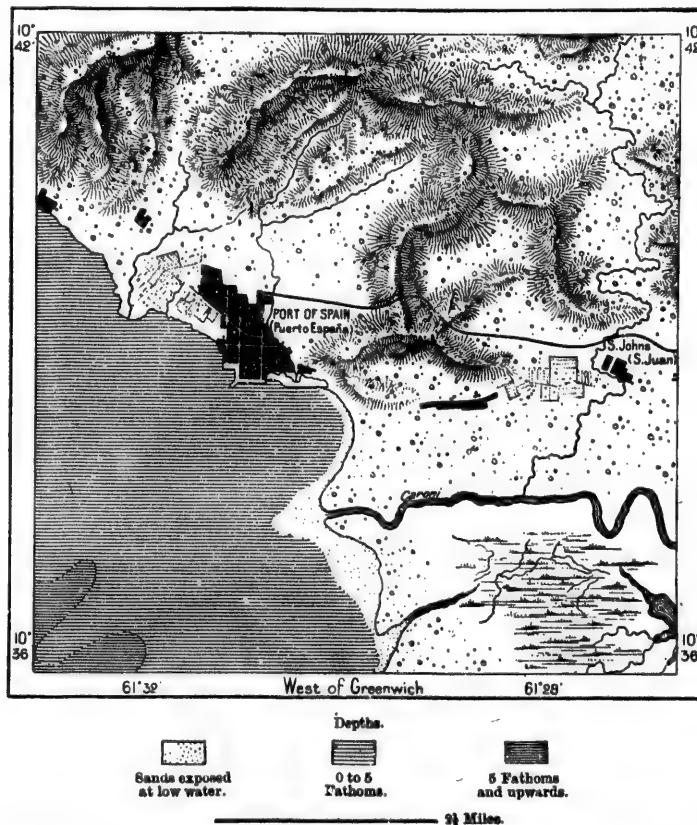
Besides its agricultural and commercial importance, Trinidad has a certain value in the eyes of the restless South American populations, as a place of refuge for political exiles and fugitives from Venezuela and the other Spanish republics. In former times it was also the headquarters of British military operations in the West Indies. Many an expedition was here organised during the wars of independence, and from this station English traders may now command the entrance of the Orinoco, one of the great highways to the interior of the continent.

Trinidad is already the depot for the Venezuelan lands which border the great river, and it might one day take the same position with regard to the Colombian plateaux through the Rio Meta.

Port of Spain (Puerto España), usually designated by the simple word "Town," is in truth the largest town, as well as the political capital, of Trinidad.* Yet

Fig. 23.—PORT OF SPAIN.

Scale 1 : 116,000.



at a distance it seems lost in the surrounding vegetation. Whole quarters are embowered in verdure, and the shady avenues of the city are continued by fine parklands towards the suburban villas dotted over the slopes of the hills. Till recently water had to be brought by boats from a distance of nearly two miles, but it is now supplied from the little river Maraval by an aqueduct three miles long.

The tranquil roadstead to which the place owes its popularity is well sheltered,

* F. H. Hart, *Trinidad*.

but too shallow for large vessels, which have to ride at anchor some miles from the quays. Despite this drawback, Port of Spain has attracted to itself nearly all the commerce of the island, while splendid natural harbours, such as that of *Chaguaramas*, near the Boca Mono passage at the extremity of the north-west peninsula, are completely deserted. Being surrounded by rocks and swamps, and remote from the cultivated districts, these havens are useless for the purposes of trade. *Chaguaramas*, sheltered by islets and reefs, is deep enough for the largest vessels, and it was here that the Spanish fleet took refuge in 1797, when Admiral Apodoca delivered it to the flames rather than accept the challenge of an English squadron of equal strength. The Spanish Government preferred to be defeated by its English enemies than defended by its French friends! * During the season thousands of visitors resort to the beach at *Chaguaramas*, to the neighbouring islets, and to the *Isla dos Monos* ("Monkey Island") in the Dragon's Mouth.

A road and, farther south, the navigable course of the Caroni connect Port of Spain with the old capital, *San Josef* (*San José*), which crowns a rising ground commanding a wide prospect of cultivated lands. Beyond this place a branch of the railway runs east to the village of *Arima*, while the main line runs south to *San Fernando* at the foot of Mount Naparima. As an agricultural centre *San Fernando* ranks in importance with the capital itself. In the district are situated the richest plantations in the island, and farther inland the villages of *Montserrat* and *Princetown* are surrounded by extremely fertile tracts in the hands of independent farmers, amongst whom are distinguished some Venezuelans of Spanish race.

ADMINISTRATION.

Trinidad, to which its neighbour, Tobago, is administratively attached, forms a British Crown Colony, so that its inhabitants are subjects with scarcely any electoral rights. The Queen appoints the governor, as well as the executive council of three members by whom he is assisted. The legislative assembly, also appointed by the Crown, consists of six *ex-officio* and eight other members. The elective principle, however, is allowed free play in the municipal affairs of the capital and of *San Fernando*, fifteen members being elected for the town council of the former and seven for that of the latter place.

The only armed forces are about 500 police and the same number of volunteers, who meet from time to time for drill and target practice. The schools, which are frequented by the great majority of the white, Hindu, Chinese, black, and coloured children, partly depend on the Government, which has founded and endowed the secular establishments, while also contributing grants in aid both to the Catholic and Protestant educational establishments. The revenue, large for a still thinly-peopled island, is derived mainly from the customs. There is a public debt of £520,000 (1892), contracted almost exclusively for the railways, which have a total length of 54 miles.

* Dauxion Lavayasse; Kingsley, *op. cit.*

The island is divided into eight administrative districts—Saint George and Saint David in the north; Caroni, Saint Andrews, Victoria and Nariva in the centre; Saint Patrick and Mayaro in the south.

IV.—MARGARITA AND NEIGHBOURING ISLETS.

Margarita, the "Pearl," one of the islands discovered by Columbus in his voyage of 1498, belongs, like Trinidad, to the Andes orographic system, although not disposed in a line with the Paria range. It develops a parallel chain, indicated by two principal masses, and reappearing some 60 miles farther west in the islet of Tortuga. In fact, Margarita may be regarded as forming two distinct islands—in the east Margarita, properly so called, in the centre of which Mount Copei rises to a height of 4,170 feet; and in the west Macanao, so named from its culminating point, 4,484 feet high.

Although of less extent than Trinidad, Margarita greatly exceeds it in the altitude of its mountains. Between the two sections of the island stretches the so-called Restinga, or Laguna Grande ("Great Lagoon"), which communicates with the gulf on the south side by a shifting channel, while on the north side the two islands are connected by a thin but continuous strip of sands. At its narrowest point this line of dunes is scarcely more than 164 feet wide between the lagoon and the open sea.

Margarita is one of those islands which were first colonised by the Spaniards. In 1499, the very year following the voyage of Columbus, Guerra discovered the pearl-banks of Coche Island off the south coast, and soon after others were reported round the main island and on the coast of the islet of Cubagua (Cuagua), which immediately attracted numerous adventurers. In 1525 a fort had already been erected on Margarita; it did not, however, prevent the capture and plunder of the island by the dreaded "tyrant," Lopez de Aguirre, in 1561. Then came the English, and in the next century the Dutch.

During the War of Independence the Margaritans took sides with the rebels, for which they were cruelly punished by the Spaniards. This earned for the insular group the official title of Nueva Esparta ("New Sparta") from the grateful republicans of Venezuela after the revolution.

As a whole the island must be regarded as arid, being largely covered with bare rocks, dunes, saline marshes, and even coral reefs formerly built up round the coast. The inhabitants find little room for tillage except in the narrow upland valleys, and their chief resources are fishing and the collection of salt, which, under the name of *sal de espuma* ("foam salt"), is highly appreciated in the trade. The women, who are very industrious, make earthenware and light cotton stuffs, besides hats of a coarse fibre, which are sold at a low price in every part of the republic.

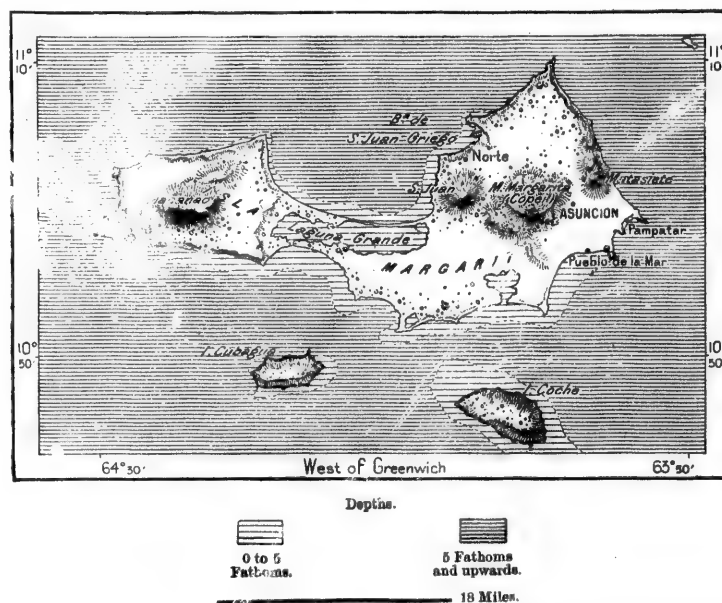
The pearl industry is almost abandoned, nearly all the banks being exhausted, while the pearls themselves have fallen considerably in value. But the fisheries proper are still very productive, that of Coche Island being farmed by the

Government to speculators at a high figure. The fish is largely captured with enormous trawl-nets, each worked by 180 or 200 hands, all members of the Guayqueri tribe. A single haul occasionally represents as much as twenty-five tons of dried fish. During the season, which lasts nine months, a good *chinchorro* (net) should take altogether at least 225 tons. When the line closes round the seething multitudes, hundreds of fishes leap out and fall into the boats which crowd round the periphery. The oil of the sharks and of the other non-edible kinds serves for lighting the houses and varnishing the boats.

Nevertheless, all this marine produce, with the slight resources of the island, are insufficient to support the inhabitants, who consequently emigrate in consider-

Fig. 24.—MARGARITA.

Scale 1 : 800,000.



able numbers to Venezuela. The great majority are half-caste Guayqueri natives, who increase very rapidly. In 1881 they numbered over 37,000, of whom more than 20,000 were women, an enormous disparity due to the emigration of the men to the mainland. In average years the birth-rate far exceeds the mortality in this salubrious island, which attracts consumptive patients from great distances.

The chief centres of population, *Asuncion*, the capital, noted for its miraculous Virgin adorned with a robe of pearls, the two ports of *Pampatar* and *Pueblo de la Mar* (*Portamar*), and, near the bay of Juan Griego, *Pueblo del Norte*, have all been founded in the eastern part of the island. *Nueva Cadiz*, founded in Cubagua

Island so early as the year 1515, and consequently the oldest of all Spanish settlements in South America, was abandoned when the neighbouring pearl fisheries ceased to be productive.

East of Margarita the little group of the Testigos ("Witnesses") recalls the presence of a formidable pirate of the first years of the eighteenth century, Captain Teach, the "Bluebeard" of West Indian legends. Frequent attempts have been made to recover his treasures, said to have been buried "three hundred paces" from a certain point in the chief island of the group.

Tortuga, farther west, is occupied by a small village and encircled by a cortège of Tortuguillos ("Little Turtle Reefs"). Blanquilla in the north, as indicated by its name, is an expanse of whitish sands and rocks with a stunted vegetation of cactuses and mimosas. A few depressions here and there have enough vegetable humus to repay cultivation. During the wars of the Revolution a planter from Guadaloupe established himself with his slaves in Blanquilla, where he wanted to set up a cotton-mill. But the Spanish Government expelled the intruders, and restored this remote land to solitude, to its wild oxen and packs of runaway dogs.

V.—THE LEEWARD ISLANDS.—FROM ORCHILLA TO ARUBA.

These islands, which run first west and then north-west in continuation of the eastern chain beginning with Blanquilla, develop an extremely regular curve parallel with the Venezuelan coast; each member of the group even affects a trend identical with that of the opposite mainland. All represent the upraised summits of a submarine ridge belonging like Margarita to the Andes system, but rising to a much lower elevation above sea-level. The culminating crest of Orchilla is only 400 feet high, while Sanct Christoffel, highest summit in Curaçao and in the whole chain, scarcely exceeds 1,200 feet.

On the other hand the islands have been enlarged horizontally by the coral-builders. The Los Roques cluster, which abuts south-eastwards on a rock 150 feet high, has its reefs rising here and there above the surface disposed in circular form like the atolls of the Indian Ocean. The neighbouring Aves (Bird Islands) are also of coralline origin, whereas Aruba (Oruba), in the extreme west, presents a nucleus of largely disintegrated syenite and granite, whose detritus forms the soil of the island, itself encircled by a broad fringe of coralline limestone.

The eastern ialets and reefs, Orchilla, Los Roques, and Aves, are uninhabitable rocks visited only by fishermen and lighthouse-keepers. After the Revolution they were left politically dependent on Venezuela, while the three western islands of Buen Aire, Curaçao, and Aruba, all of relatively large size and cultivable, had long previously been detached from Spain.

CURAÇAO.

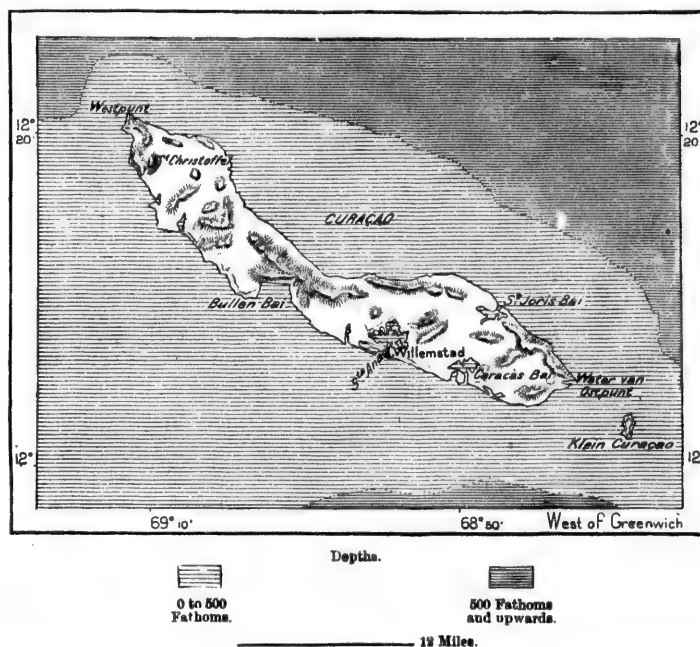
In 1499 Hojeda had already discovered Curaçao, which he called the "Ile of Giants." It was occupied to the sixteenth century by some Spanish settlers, but

it was seized in 1632 by the Dutch, who remained masters of the archipelago till the wars of the Empire, when it was temporarily occupied by the English and restored to Holland in 1814. Despite its small extent and scanty population, this colony is highly valued by its possessors on account of the deep and well-sheltered harbour on the south coast of Curaçao. At the time of the conquest by the Dutch traders Curaçao was still inhabited by a tribe of about 500 aborigines, who are said to have accompanied the Spanish settlers to the mainland.

Willemstad, capital of the colony, lies on the east side of the harbour, which is still often designated by its old Spanish name of *Santa Ana*. The capital itself is

Fig. 25.—CURAÇAO.

Scale 1 : 700,000.

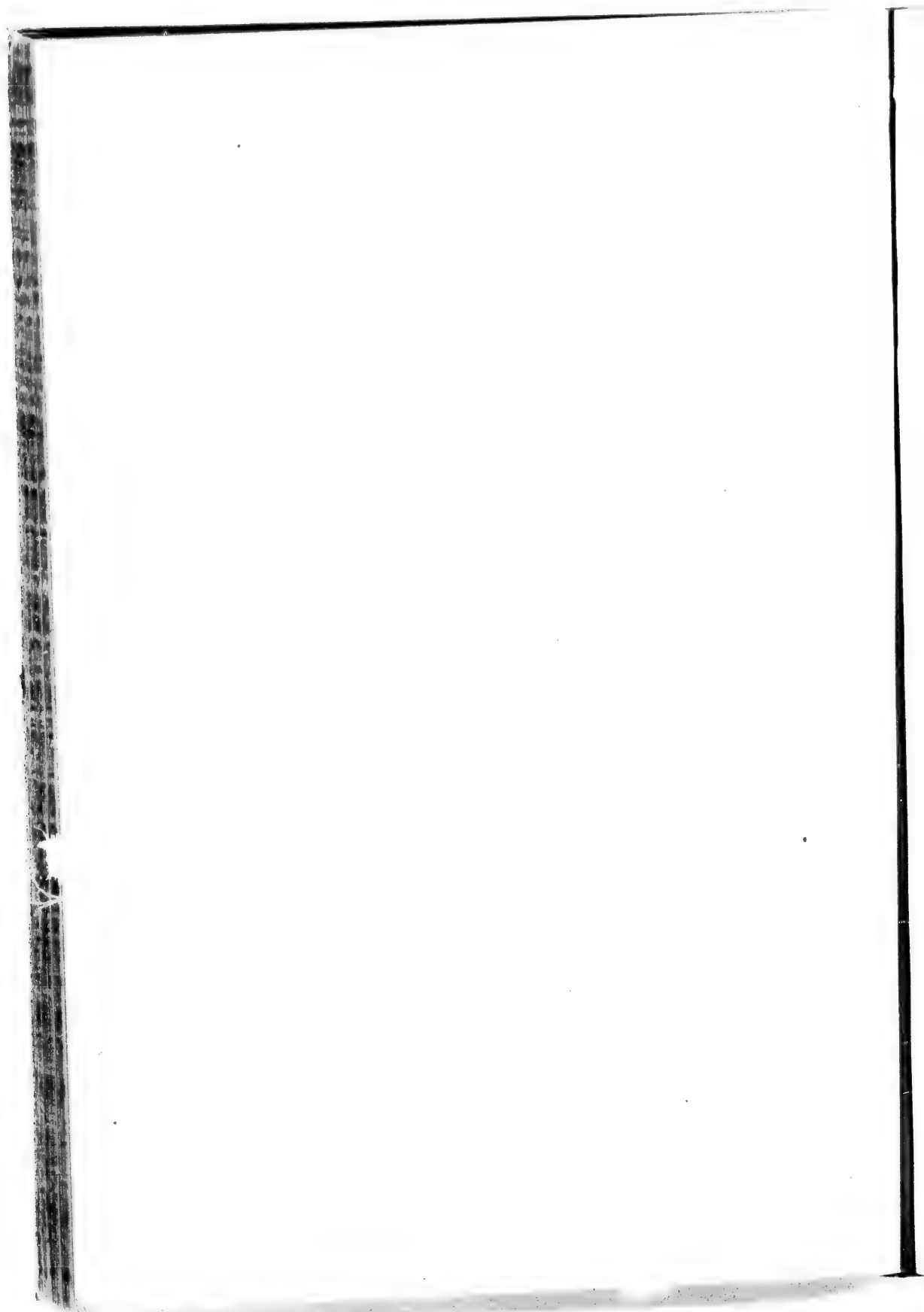


better known by the name of Curaçao, which is that of the whole island. The houses are built in a style resembling that of Amsterdam as far as was possible under the conditions required by a tropical climate. In the passage separating it from the western suburb of *Overzijde* ("Overaide"), and in the swampy waters ramifying inland, Willemstad also presents the aspect of a Dutch town. The quays are everywhere crowded with shipping, while men-of-war ride at anchor in the Schottegat, a deep lagoon forming a northern extension of the harbour. A bridge of boats connects the capital with its suburb just above two forts guarding the entrance to the basin, which is accessible to the largest vessels through a channel 6 to 10 fathoms deep.



GENERAL VIEW OF WILLEMSTED (SANTA ANA DE CURAÇAO).

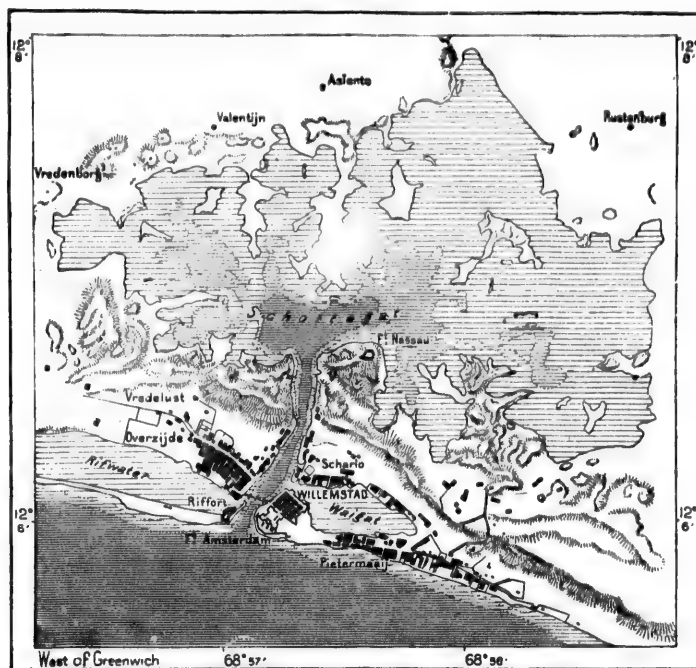
JAY LOR



Like those of Buen Aire the plains of Curaçao are largely occupied by arid wastes. Nevertheless, some sugar, tobacco, fruits, and vegetables are raised for the export trade in a few glens, some naturally fertile, others rendered productive by much patient labour. The Willemstad traders also forward phosphate of lime obtained in Klein Curaçao, a rocky islet near Buen Aire. Other products of the colony are the seeds of the *dividivi*-tree, used for tanning, and considerable quan-

Fig. 26.—WILLEMSTAD.

Scale 1 : 48,000.



ties of salt, till recently procured by natural evaporation alone, but now more rapidly crystallised by artificial processes.

But the local traffic is of small account compared with the transit trade with the Venezuelan mainland, to which Willemstad is mainly indebted for its commercial prosperity. Here the Colombian and Venezuelan shippers obtain the vessels and crews engaged in the coasting trade, as well as the advances required to carry on their operations. The Jewish and Christian bankers of Curaçao are amongst the principal creditors of the Hispano-American speculators. Like Trinidad, the

Dutch island has also long served as a place of refuge and a centre of political intrigue for the exiles and conspirators of the neighbouring republics. Willemstad is also a sort of linguistic capital, for here more than elsewhere is current the so-called *papamienta* (*papimienta*), a curious lingua franca composed of Spanish, Dutch, English, and native (Aruba and Goajira) elements. It even contains some Portuguese words, the presence of which is difficult to explain, the Portuguese never having navigated these waters.

ARUBA.

Aruba, westernmost member of the group, formerly bore the name of Azua, from a shrub very common in the locality. It is the best cultivated of the three Dutch islands, although suffering from a want of water, which has to be husbanded in cisterns or drawn from tidal wells sunk in the sands. Now seldom visited by travellers, Aruba is, nevertheless, the most interesting island in the archipelago from the archaeological point of view. Here are found many stone and clay objects, besides rock inscriptions of Indian origin. The earthenware is almost invariably embellished with little figures representing frogs' or owls' heads. The inscriptions, painted in various colours, but never carved, differ little from those occurring in many places on the mainland.*

The aborigines, all half-breeds, have preserved nothing of their native language except certain forms of incantation and medical recipes. Till recently they deposited their dead in large cone-shaped vessels, which were buried under little barrows. The Spanish conquerors found in Aruba a populous city abounding in the precious metals, which gave rise to the whimsical and evidently erroneous etymology of the name Aruba (Oruba): *Oro hubo!* "Here was gold!" At present only faint traces of the precious metals can be detected in the rocks of the island. According to the geologist Martin, Aruba was the last member of the Leeward group to be separated from the mainland. Here are still seen some species of animals which have disappeared from Buen Aire and Curaçao; such especially are a species of parroquet, a frog, and a rattlesnake. In recent times indications have been observed of an upheaval of the coasts.

* Alph. Pinart, *Exploration de Curaçao et d'Aruba*.



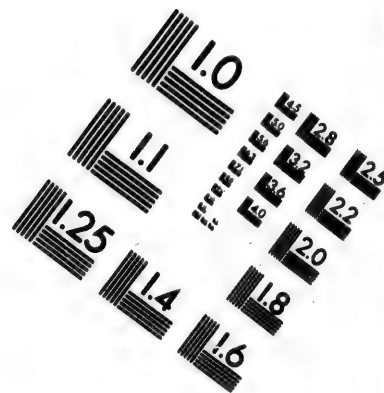
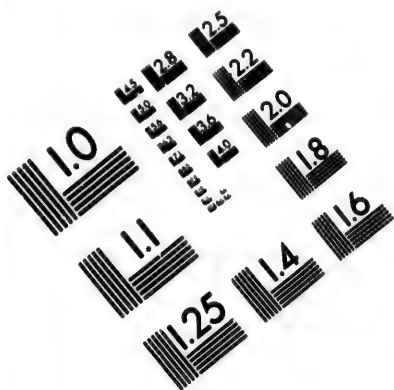
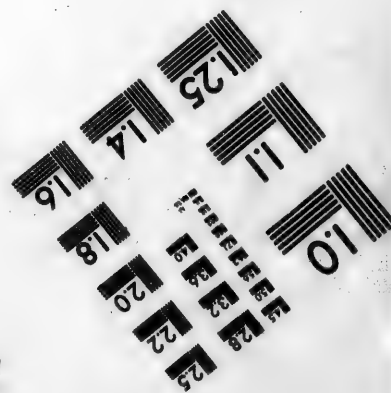
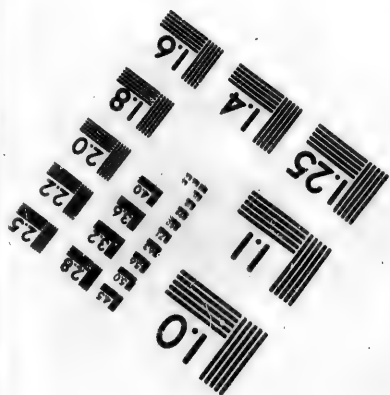
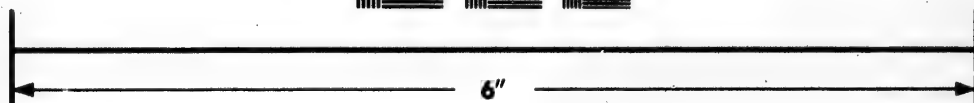
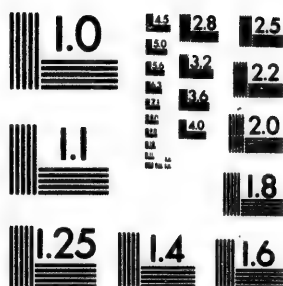


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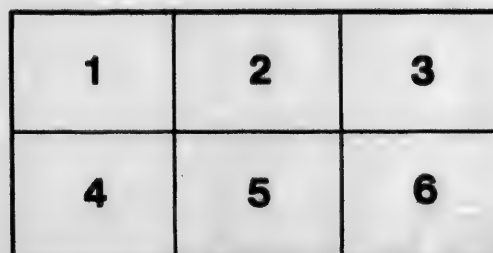
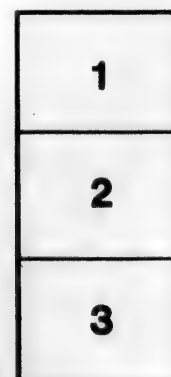
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GRAN CHACO INDIANS.

THE
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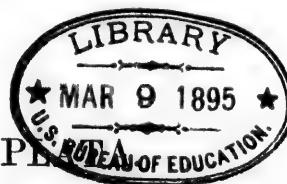
SOUTH AMERICA.

BY
ÉLISÉE RECLUS.
"

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A PARTING WORD.



N completing this long work, begun in the days of my youth, I may congratulate myself on the good fortune by which, in the course of a life not lacking in stirring incidents, I have been enabled to fulfil my engagements of regular publication, without ever once breaking faith with my readers. At the same time I am well aware that the best intentions and most conscientious labour would have been inadequate to such an undertaking, but for the devoted fellow-workers who have constantly aided me by their researches and advice.

A feeling of gratitude must therefore be uppermost, and my thanks are accordingly given to all friends who have directly or indirectly helped me by notes, studies, correspondence, corrections, encouragement, or criticism. But this acknowledgment can no longer reach all those to whom it is due! A retrospective glance shows the path marked at intervals by the memory of comrades in work garnered by death. Towards them above all my thoughts are turned at the close of my task. On this last page I record the name of Emile Templier, who sought me out on the pontoons of Brest with a view to the publication of the long contemplated *Earth and its Inhabitants*.

This period of twenty years, long relatively to the life of a man, is as nought in the history of the Earth; yet how well it has been utilised! How many discoveries and explorations have followed one on the other, adding to our previous

knowledge and requiring us to modify our description of the world! Although the mystery of the Poles is still unrevealed, Nansen has at least made his astonishing journey from shore to shore of ice-capped Greenland. In the interior of Asia, the "Eternal Sanctuary," where dwells the divine Dalai-Lama, has since Huc's visit been closed to profane Europeans; nevertheless, every year sees the circle of itineraries narrowed round about the sacred spot.

In the "Dark Continent," the problems of the Nile, of the Zambesi, Congo, and Niger have all been solved. Everywhere the network of travels covers the planet with its ever-contracting meshes. A systematic exploration has even been begun of the underground world, of the caves and katabothras of Greece, the subterranean pits and channels of Vaucluse and the Causses. The chart of the marine depths, with their temperatures, living organisms, and geological deposits, is progressing, like that of the continents, towards completion. As knowledge increases, man, so to say, becomes daily transformed to a new life.

At the same time distant lands are constantly drawn closer together. The Atlantic, a broad expanse for Norse Vikings and Genoese mariners, has become, in the language of modern seafarers, a mere "ditch" traversed in a hundred hours. Every year diminishes the time taken to make the tour of the world, which for certain "globe-trotters" has become a caprice of the moment. So bounded are now the confines of the planet, that it everywhere benefits by the same industrial appliances; that, thanks to a continuous network of postal and telegraphic services, it has been enriched by a nervous system for the interchange of thought; that it demands a common meridian and a common hour, while on all sides appear the inventors of a universal language. Despite the rancours fostered by war, despite hereditary hatreds, all mankind is becoming one. Whether our origin be one or manifold, this unity grows apace, daily assumes more of a quickening reality.

In the presence of this world, which is modified from day to day, and whose changes I can follow only from a distance, I have nevertheless endeavoured clearly to realise the lands described, as if I had them actually under my very eyes, and to study their inhabitants as if I had mingled in their society. I have striven to live my pictures, revealing the characteristic features of each region, portraying the peculiar genius of each human group. Everywhere, I may say, I have felt at home, in my native land, amid my brother men. I am not conscious of having

been swayed by any sentiment other than one of sympathy and respect for all the inhabitants of the universal fatherland. On this ball, that spins so swiftly in space, a grain of sand in infinitude, is it worth while to cherish mutual hatreds?

But while taking my place at this standpoint of human solidarity, my work seems still unfinished. Before studying in detail the planetary surface and the peoples inhabiting it, I had tried in another work, *The Earth*,* to study the life-history of the globe itself, such as it is presented isolatedly, prepared to receive the humanity by which the great body is animated. That work was a sort of introduction to the series of volumes which I now bring to a close. But is not a conclusion still lacking?

Man, like the Earth, has his laws.

Seen from above and from afar, the diversity of features intermingled on the surface of the globe—crests and valleys, meandering waters, shore-lines, heights and depths, superimposed rocks—presents an image which, so far from being chaotic, reveals to him who understands a marvellous picture of harmony and beauty. The man who searchingly surveys this universe, assists at the vast work of incessant creation, always beginning, never ending, and himself sharing by the largeness of his grasp in the eternity of things, he may, like Newton, like Darwin, find the word that sums all up.

And if the earth seems consistent and simple amid the endless complexity of its forms, shall the indwelling humanity, as is often said, be nought but a blind chaotic mass, heaving at hazard, aimless, without an attainable ideal, unconscious of its very destiny? Migrations in diverse directions, settlements and dispersions, growth and decline of nations, civilisations and decadence, formation and displacement of vital centres; are all these, as might seem at the first glance, mere facts, nay, facts unconnected in time, facts whose endless play is uncontrolled by any rhythmical movement giving them a general tendency, which may be expressed by a law? This it is that it concerns us to know. Is the evolution of man in perfect harmony with the laws of the Earth? How is he modified under the thousand influences of the modifying environment? Are the vibrations simultaneous, and do they incessantly modulate their tones from age to age?

* *The Earth*: A Descriptive History of the Physical Phenomena of the Life of our Globe. By Elisée Reclus.

Possibly the little already known may enable us to see farther into the darkness of the future, and to assist at events which are not yet. Possibly we may succeed in contemplating in thought the spectacle of human history beyond the evil days of strife and ignorance, and there again behold the picture of grandeur and beauty already unfolded by the earth.

Here is what I would fain study according to the measure of my strength. From the myriad facts which I have had to record from chapter to chapter I would fain extract a general idea, and thus, in a small volume written at leisure, justify the long series of books now ended without apparent conclusion.

ELISÉE RECLUS.





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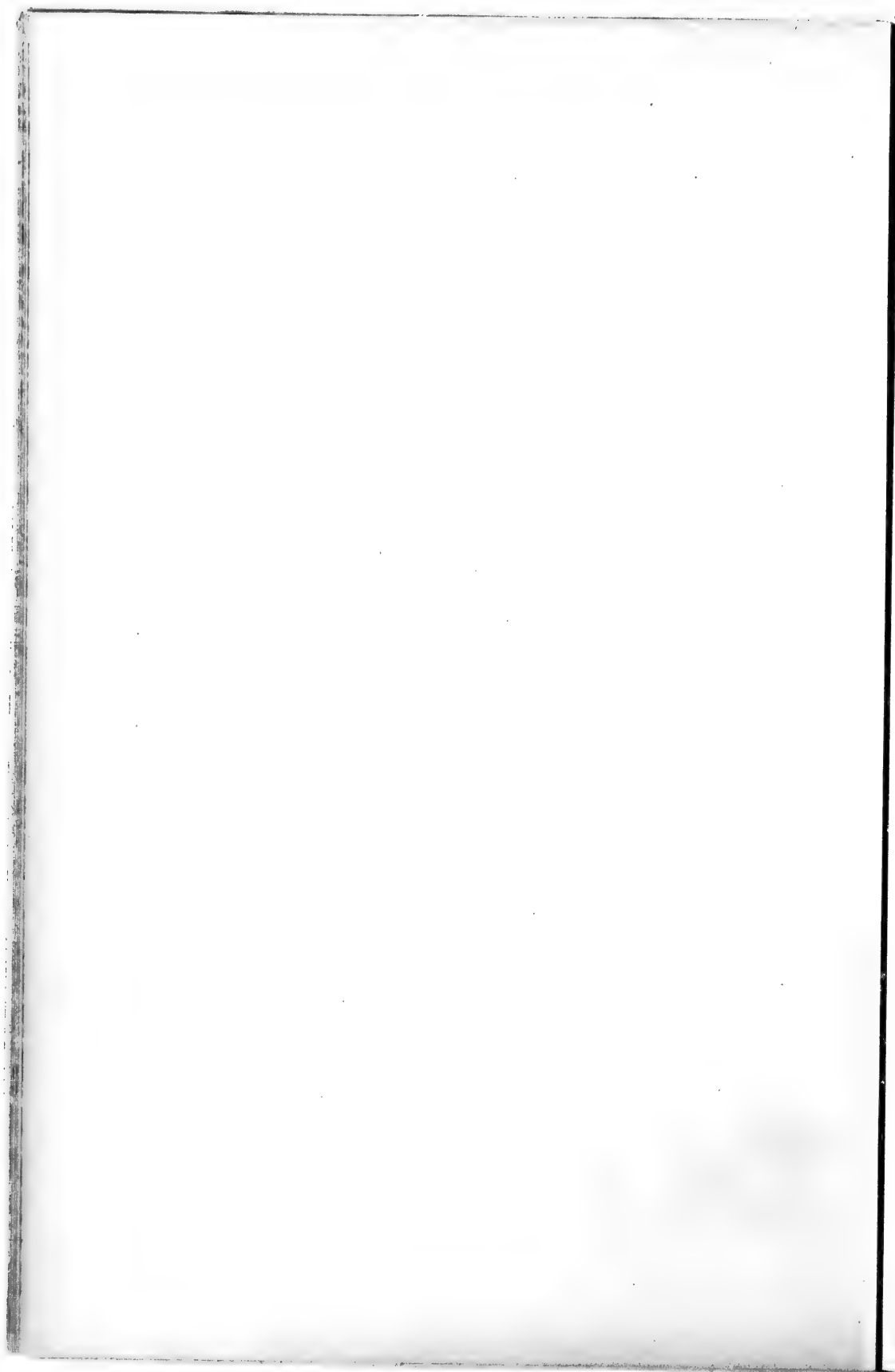
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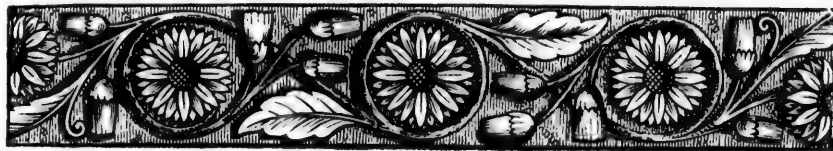
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THE EARTH AND ITS INHABITANTS.

AMAZONIA AND LA PLATA.

CHAPTER I.

THE GUIANAS.

GENERAL SURVEY.



URING the last three centuries the term Guiana, as a geographical expression, has been diversely modified. When the first Spanish, English, and Dutch navigators visited the banks of the Orinoco they found them occupied by the Guayano, Guayana, or Guayanaze Indians, whose name came to be applied in a vague way to the whole region roamed by them south of the great river. This extension of its meaning was all the more natural that the word was already current in various forms, not only as a tribal designation, but also as the name of several rivers in different parts of the Continent.

Thus the Guaraunos (Warauns) of the Orinoco delta would appear to be simply Guayanos; the Rucuyennes farther east also called themselves Wayana, and gave the same name to a great tree, mythical protector of the tribe. Lastly the Upper Rio Negro, in its higher reaches below the Andean foothills, bears the name of Guainia, a native term identical with Guiana, as is also Waini or Guainia, the name of one of the coast streams between the Essequibo and the Orinoco delta.

But the name Guiana, as first employed by Europeans, did not include the Atlantic coastlands, which are at present more particularly designated by that name. It was, in fact, restricted to the region now known as Venezuelan Guiana, and was thus limited by the vast semi-circular bend of the Upper Orinoco. But in geographical terminology it gradually acquired a wider application, being at first extended to the Brazilian lands bounded southwards by the Rio Negro and the

Amazons, and then to the eastern slopes of the mountains, formerly known, in a general way, as the Serra de Parima, and figuring on the early maps as Caribana, that is to say, "Land of the Caribs."

EXTENT—NATURAL DIVISIONS.

Within these wider limits Guiana constitutes a well-defined section of the South American mainland. It comprises the whole of the oval space, some 800,000 square miles in extent, which is cut off from the rest of the Continent by the valleys of the Orinoco, Cassiquiare, Rio Negro, and Lower Amazons. This vast region of South America has been called an "island," but there is no question here of a real island completely encircled by a navigable waterway. Although it may probably one day assume this character, by means of a series of artificial canals, the navigation is at present interrupted by the famous Aitues and Maipures rapids on the Orinoco, as well as by others on the Cassiquiare and on the Upper Rio Negro, where boatmen have to land their goods and surmount the obstructions by portages. Thus, even under the most favourable conditions of weather, currents, and conveyance, the circumnavigation of Guiana could not at present be completed under three or four months.

From the geological standpoint also, Guiana constitutes an isolated region distinct from the rest of the mainland. It consists of a separate mass of granites and other eruptive rocks, which have been upheaved since the Triassic epoch.

The whole system, however, presents considerable diversity, and may be decomposed into four nearly equal natural divisions by two lines intersecting each other at right angles. The first is formed by the crests of the mountains which are disposed nearly parallel with the equator, running from the low water-parting near the Cassiquiare towards the northern headland of the Amazons estuary. The second is somewhat less distinctly indicated by the transverse depression traversed in one direction by the Essequibo, in the other by the Rio Branco.

POLITICAL DIVISIONS.

But the rival conquering Powers in the American continent could scarcely be expected to pay much attention to this natural segmentation of the Guianas, more especially as the European settlers had easy access only to the coastlands and the banks of the great rivers. Even within a few miles of the sea the interior of the country long remained absolutely unknown. Adventurers made their way into the recesses of the forests and savannas, but they brought back no clear geographical details, and of the mountainous central regions nothing was known beyond vague or fabulous reports. As in so many other parts of the southern continent, rumour spoke here also of the *El Dorado*, who was supposed to bathe in liquid gold, and who dwelt in an emerald and ruby palace. Frequent attempts were made to discover this "man of gold" and plunder his treasures. But no systematic exploration was undertaken before the present century.

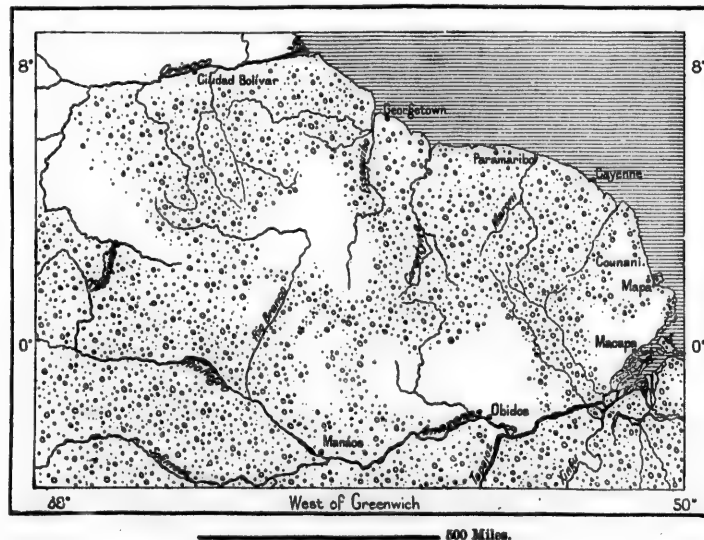
Thus it happened that the political divisions were made, not along the lines of natural separation, but were developed from the seaboard towards the interior. Spain, whose domain is inherited by the republic of Venezuela, took possession of

the whole of northern and western Guiana, along the crescent described by the Orinoco. Portugal, now replaced by Brazil, appropriated that section of the Guianas which lies on the Amazonian slope. Thus for the other European Powers nothing remained except the maritime region comprised between the Orinoco delta and the estuary of the Amazons.

Here the English, Dutch, and French secured a footing as conquerors and colonists. To their settlements on the seaboard they added the "hinterlands" of all the coast streams traversing their several domains, claiming the whole region between the sea and the unknown watersheds of those rivers. The three colonial

Fig. 1.—ISLAND OF THE GUIANAS.

Scale 1 : 20,000,000.



domains thus constituted form the territory now specially known as Guiana, properly so called.

The frontiers of these colonies, however, are still fluctuating. Towards the south the water-partings have not yet been surveyed in their entire length and in all their intricate details. Numerous expeditions have been undertaken in this direction, but none of them have been commissioned to determine with accuracy the parting lines between the several conterminous territories.

Towards the west and east the question of frontiers assumes a different aspect, and here tracts of considerable extent are still a subject of contention. Great Britain claims a right not only to the whole of the Essequibo basin, but also to a section of the upper Rio Branco, which is disputed by Brazil. In the direction of Venezuela the frontiers of British Guiana have been advanced to the southern margin of one of the chief branches of the Orinoco delta along the channel of

the Amacuru. The boundary has also been drawn so as to include the rich auriferous alluvia of the Cuyuni valley, and the whole of the disputed territory, which has already led to sanguinary conflicts, comprises a superficial area more extensive than that of the region recognised as belonging indisputably to Great Britain.

At the other extremity of the Guianas, France contests with Brazil a large tract estimated at about half the size of France. The district in dispute forms a long strip of the Amazons basin, extending along the Atlantic seaboard between the Araguari and the Rio Branco. All these disputed lands on the south, west, and east frontiers form so many distinct political domains comprised within the natural limits of the "island of Guiana." The whole region thus contains five separate territories, with superficial areas as under :—

	sq. miles.
British Guiana, including the district disputed by Brazil . . .	45,700
Guiana contested by Great Britain and Venezuela . . .	50,600
Dutch Guiana (undisputed)	45,700
French Guiana (undisputed)	31,000
Guiana contested by France and Brazil	100,000
Total according to H. Coudreau	272,400

All these Guianas greatly resemble each other in their general physical aspects, their geographical constitution, the direction and character of their running waters and marine currents, the erosions and deposits of their coastlands, their climatic relations, the distribution of their animal and vegetable species, the affinities of their indigenous populations. To human agencies are mainly due the chief contrasts observed in the different colonial territories, which have been subjected by the respective mother countries to different social and economic conditions. Numerous travellers, some acting on individual impulse, some in their official capacity, have carefully studied many of the river valleys, agricultural and mining districts, and their itineraries have been connected with those of other explorers who have traversed the whole region, either from one slope to the other, or from the banks of the Orinoco to those of the Amazons. Thanks to these collective surveys, a general picture may now be formed of the physical and biological features of the Guianas.

PROGRESS OF DISCOVERY AND SETTLEMENT.

Our first knowledge of the seaboard is due to the Spanish navigator, Vicente Yañez Pinzon, who had accompanied Columbus on his voyage of discovery. In the year 1500 this pioneer, after coasting the shores of Brazil east of the Amazons, crossed the estuary and skirted the low-lying coasts of Guiana as far as the Orinoco delta. He was followed by Diego de Lepe and other mariners, who explored the same waters; but nearly a century passed before any European settlers ventured to penetrate into the interior.

A few Spaniards had already landed on the coasts near the Orinoco, when some Dutchmen attempted in 1581 to establish themselves on the banks of the Demerara and open trade with the natives. Other pioneers were attracted by the love of

adventure and by the hope of discovering the treasures of El Dorado. In 1596 the English explorer, Keymis, following in the footsteps of Sir Walter Raleigh in the "Empire of Guaya," that is, in Spanish Guiana, went in quest of the fictitious lake Manoa, which figures on Raleigh's map as a great sheet of water 200 miles long, with a city at its eastern extremity, reported to be "the largest in the world." This map, for the first time published in 1892,* shows the course of the Orinoco and Amazons rivers, and covers the whole continent from their mouths to the Pacific coast. Writing in 1595 to Lord Charles Howard on "the discovery of the large, rich, and beautiful empire of Guaya," Sir Walter remarks in reference to the map: "How these rivers crosse and encounter, how the country lieth, and is bordered, the passage of Camenes, and of Berreo, mine own discoverie, and the way that I entred, with all the rest of the nations, and rivers, your lordship shall receive in a large chart or map, which I have not yet finished, and which I shall most humbly pray your lordship to secret, and not to suffer it to pass your own hands; for by a draught thereof all may be prevented by other nations. For I know it this very yeere sought by the French, although by the way they now take I fear it not much."

But instead of taking the route of the Orinoco, Keymis ascended the river Oyapok, which traverses the region that has since become French Guiana. In 1688 la Motte Aignon sailed up the same river a distance of "fifty leagues" from the sea, in the vain hope of reaching the banks of the Amazons, and perhaps even of discovering the route leading to the famous region of gold and precious stones.

So late as 1739 the same mirage of a city with houses of rubies and other gems was still powerful enough to attract Nicolas Hortsman, who, following the course of the Essequibo, penetrated far into the interior.

But regular colonisation had its origin not in adventure but in commerce. Once settled on the Guiana seaboard, the traders of various nationalities began to struggle for the ascendancy in the conquered lands, and their respective Governments took part in these rivalries by organising warlike or plundering expeditions. Thanks to these expeditions a better knowledge was gradually acquired of the more favoured districts on the seaboard; the geographical features of the coastlands, estuaries, and watercourses as far as the first rapids, were more accurately laid down, and some vague notions of the inland regions were obtained from the reports of the Indians and of the Bush Negroes.

In 1672 Richter made his famous discovery of the flattening of the globe at its poles. Two years later the Jesuits, Grillet and Béchamel, were sent to Cayenne to study the physical geography of the country; but after penetrating to the territory of the Nurag and Acoqua Indians, these pioneers succumbed to the hardships of the journey. The scientific exploration of the Guianas was thus delayed till the eighteenth century, when a beginning was made in 1743 and 1744 by

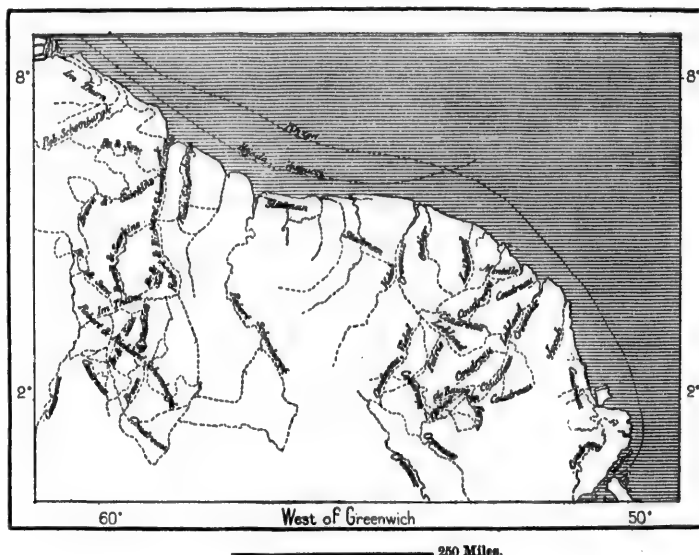
* Sir Walter Raleigh's *Karte von Guyana um 1606*, von L. Friedrichsen. Separatabdruck aus *Festschrift der Hamburgischen Amerika-Feier*, 1892. This is a fac-simile of the original preserved in the British Museum.

Barrère and by La Condamine on his return from his memorable expedition to the equatorial Andes.

Twenty years later Simon Mentelle arrived at Cayenne, where he sojourned under conditions of the greatest difficulty for thirty-six years. During this period he visited, in his capacity as engineer, the whole of the seaboard of French Guiana, and had his advice been attended to, many a disastrous expedition would have been avoided. The same region was traversed in 1762-64 by the botanist, Fusée Aublet, whose work on the *Plants of Guiana* is still a standard book of reference. In 1787 his associate, Patris, ascended the Oyapok and its Camopi affluent, and Leblond, another naturalist of considerable intelligence and enterprise, followed nearly the same route, returning by the river Sinnamari. He spent

Fig. 2.—ROUTES OF THE CHIEF EXPLORERS OF GUIANA.

Scale 1 : 13,000,000.



several years in exploring a great part of the land, studying its economic plants, searching especially for the quinquina, which he failed to find, observing the aborigines, and developing projects for the settlement of the uplands.

Both in French and Dutch Guiana the engineer Guisan constructed numerous navigable and drainage canals, taking advantage of these works to investigate the character of the soil, climate, and local products. Stedman, an English officer in the Dutch service, turned to profitable account a residence of five years (1772-77) in the interior of the colony of Surinam. He has left us a valuable record of his travels and observations in this region, as well as an excellent history of the wars with the Bush Negroes, in which he was actively engaged.

Later the gangs of convicts transported to French Guiana contributed to a

wider knowledge of the country; for which, however, they earned the evil reputation of a land of pestilence and death. Of all the educated exiles who eventually returned to the mother country, not one was found capable or willing to prepare a work of permanent value on the land of his banishment.

After the wars of the Revolution and of the Empire the first voyages of discovery modelled on the memorable expeditions of Humboldt and Bonpland to the New World were those undertaken by the brothers Schomburgk in the years 1835-39. After investigating nearly the whole of British Guiana, these distinguished travellers crossed the mountains and connected their itineraries with those of Humboldt and other explorers in the Orinoco basin. In French Guiana the divide between the Oyapok, Yari, and Araguari rivers had already been crossed by Adam de Bauve in 1830. Leprieur had traversed the same regions, descending the Yari for a distance of over fifty leagues, while Gatier surveyed the course of the Mana to its sources.

During the twenty years from 1849 to 1868, Appun, friend and associate of the forest Indians, devoted himself to the study more especially of the plants and animals of exuberant tropical nature in British and Venezuelan Guianas; the geologists Brown and Sawkins continued on the mainland as far as the Pacaraima mountains the researches they had successfully carried out in the neighbouring island of Trinidad; Idenburg occupied himself with the climatology and sanitary condition of Dutch Guiana; Crevaux in 1876 and Coudreau in 1883 resumed the work of the Schomburgks at other points nearer to the Amazons, thus connecting the itineraries of the seaboard with those of the inland Brazilian slopes in the Rio Branco and Rio Negro basins.

Since the year 1883 Everard im Thurn has been occupied with careful cartographic surveys of the disputed north-western territory claimed by Great Britain on the Venezuelan frontier. Triangulations are still lacking for accurate maps of that region, but we already possess all the elements needed to lay down with sufficient precision the course of the ramifying streams and the relief of the mountains, bringing the details into harmony with the more scientific surveys of the coastlands and fluvial estuaries.

Of the numerous publications dealing with the geographical literature of the Guianas, their populations, administration, and economic conditions, some are of great value to students of anthropology and political economy. Amongst them are the writings of Kappler and Anthony Trollope, Gifford Palgrave's *Dutch Guiana* (1876), and, above all, Everard im Thurn's classical work on *The Indians of Guiana* (1883).

PHYSICAL FEATURES—RORAIMA.

Between Venezuela and British Guiana the chief mountain mass, forming the natural frontier of both regions, is the superb Roraima, a square block or table of pink sandstone, which discharges from a height of 7,500 feet several cascades blown into ribbons of spray by the breeze. The whole system of mountains, collectively known as the Pacaraima range, presents its loftiest crests to the west and south-west in the Upper Rio Branco basin.

Towards the east, that is, in British Guiana, few of the peaks and terraces exceed 3,000 feet. But despite their moderate elevation these mountains present an imposing aspect, thanks to their sandstone walls rising hundreds of yards vertically above the surrounding plains, their bare white cliffs forming a striking background to the tropical vegetation which clothes the talus accumulated at their base.

Roraima is continued north-eastwards in the direction of the Mazaruni river by other quadrangular masses, which present the appearance of citadels raised by the hand of man. The regular disposition of the upper strata, level as the surface of the marine waters in which they were deposited, recalls the geological epoch when the now deeply eroded face of the land presented the aspect of a vast uniform plain unbroken by a single undulation of the surface.

THE PACARAIMA MOUNTAINS.

Carved by the running waters into distinct sections, trending for the most part north-west and south-east, the Pacaraima ("Basket") Mountains gradually contract in the direction of the east. Here they terminate on the banks of the Essequibo in a bold diorite bluff resembling a calabash, whence its Indian name, *Camuti*. The unfossiliferous sandstone range is pierced here and there by other diorite masses. In the depths of the surrounding forests is occasionally heard a loud noise like a long peal of thunder, which may probably be caused by portions of the vertical cliffs from time to time giving way and falling with a crash.*

South of these mountains, which are the highest on the Guiana slope of the Atlantic, follow other less elevated masses rising in the middle of the savannas, which appear to have at one time formed the bed of a vast inland sea disposed in a line parallel with the neighbouring oceanic waters. Canucu, Cumucumu, Coratamung, and the other isolated groups, which have a mean altitude of about 2,000 feet, formerly constituted a chain of crystalline schist or gneiss islands disposed in the same direction as the Pacaraima range.

Farther south other ridges of like formation run east and west between the Essequibo and the copious Takutu affluent of the Rio Branco. These eminences rise above alluvial lands, which at some remote epoch were also flooded by lacustrine waters. In several places the parting line between the Atlantic and Amazonian basins is indicated by no perceptible rising ground, and, according to Brown, this low-lying divide has an absolute elevation of not more than 348 or 350 feet. One of its depressions is flooded by the little Lake Amuku, which lies on the zone of separation between the Pirara, a sub-affluent of the Takutu, and the Rupununi tributary of the Essequibo. Hence in this region of savannas the passage from one slope to the other is extremely easy, and has been followed at all times by the Indian tribes in their migrations between the Amazonian and Atlantic watersheds.

The absence of natural frontiers between the Essequibo and Amazon basins

* Charles Barrington Brown, *Canoe and Camp Life in British Guiana*.

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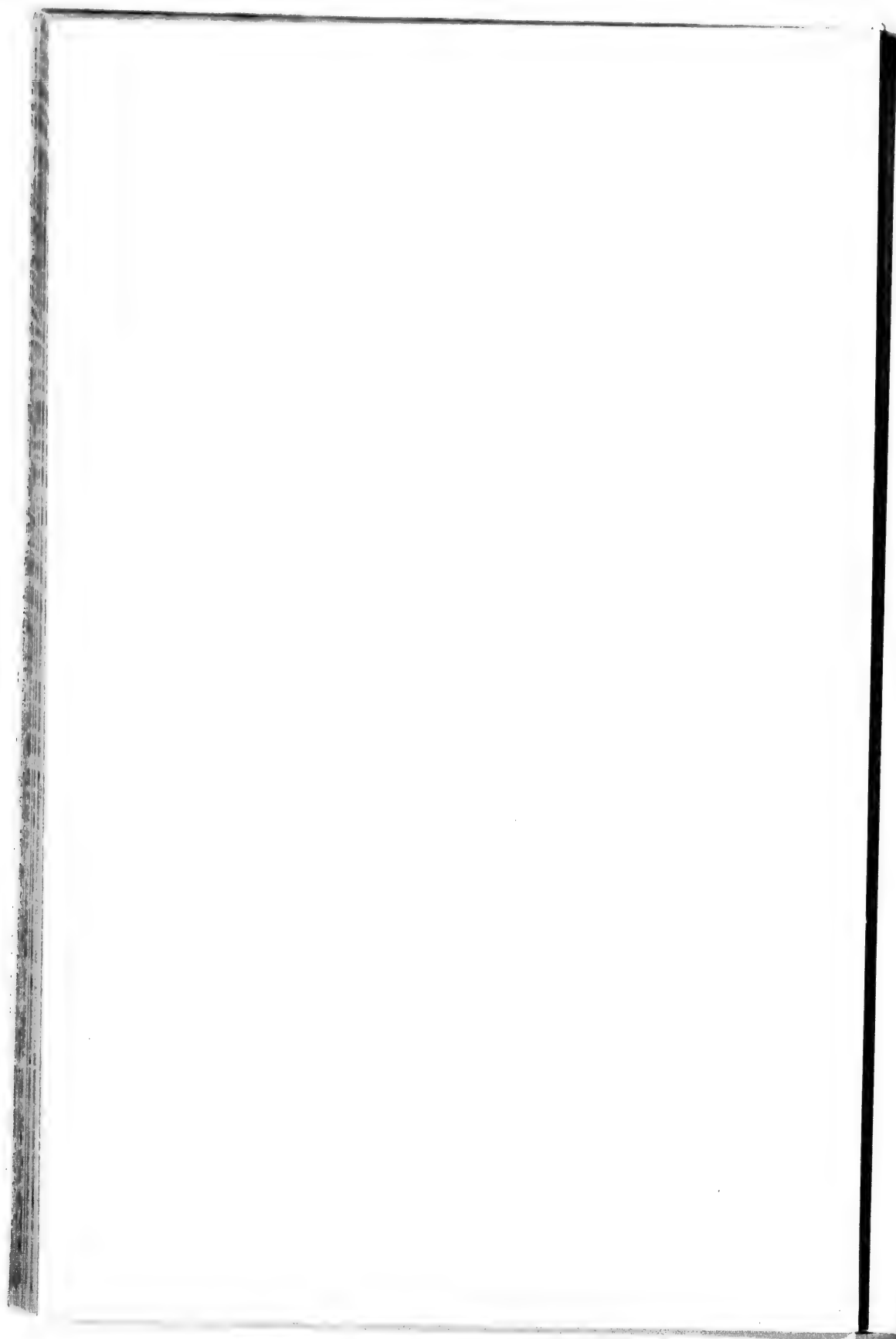
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MOUNT BORAIMA.



also accounts for the differences that have arisen between the Governments of Great Britain and Brazil regarding the limits of their respective domains about the sources of the Essequibo and Rio Branco affluents. The whole of the dividing zone sometimes takes the name of the River Parira, a word of Macusi origin, which, according to Schomburgk, indicates the geological constitution of the land—a ferruginous conglomerate. Above the water-parting rises a column of trap formation, which is regarded as a sacred object by the surrounding Macusi Indians.

A few other isolated groups follow southwards as far as the neighbourhood of the sources of the Essequibo, which stand at an altitude of about 820 feet. Here the heights, glimpses of which are at rare intervals obtained from the river banks across the dense foliage of the primeval woodlands, do not develop a continuous amphitheatre of rounded hills, but form a number of distinct ridges sharply defined by deep transverse gorges. They constitute so many "huge blocks, some of which have a length of about 90 miles, standing on very low pedestals of plateau formation."*

According to Coudreau, the loftiest summit in this region is Coïrrit, or Caïrrid Dekeuou (Brown's Acarai), the "Mountain of the Moon," which lies near the sources of the Takutu, and attains an altitude of about 5,000 feet. It is the culminating peak of a ridge with a mean elevation of some 3,000 feet, which sweeps round in a vast bend first to the south and then to the east, as far as Mount Aourriawa, where rise the headwaters of the Essequibo. Farther on are developed the Curucuri heights, seen from a distance by Coudreau. Here the water-parting coincides exactly with the crest of the mountain range. On one side descend the streams flowing to the Essequibo, on the other those flowing to the Trombetas affluent of the Amazon.

The sierra falls in the direction of the east, where it forms the natural boundary between Dutch Guiana and Brazil. According to Brown, the highest summits rise scarcely 300 feet above the sources of the River Corentyne, which forms the frontier line between Dutch and British Guiana.

THE TUMUC-HUMAC RANGE.

Farther on the system again rises, and here takes the name of the Tumuc-Humac range, a term of unknown meaning. From its northern slopes descends the Maroni, the chief watercourse of French Guiana. According to Coudreau, its highest summit is Mount Timotakem (2,624 feet), which lies in the western section of the range. Few of the travellers that have visited this mountainous region have laid down accurate itineraries of their routes, and hitherto (1894) Coudreau is the only explorer who has mapped the main range with any approach to accuracy. It is all the more difficult to determine its exact form and trend that all the slopes, as well as the intermediate valleys, are clothed with a continuous mantle of dense woodlands.

None of the Tumuc-Humac crests are lofty enough to rise above the zone of

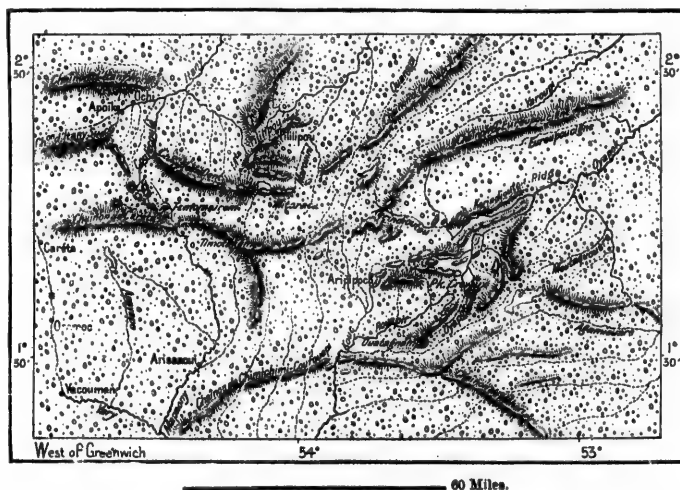
* Henri A. Coudreau, *la France Équinoxiale*.

tropical vegetation; hence the same species occur on their slopes and summits as on the surrounding plains, and their thickets everywhere present the same obstacles to the progress of the wayfarer. The winter fogs also, which creep up to the highest summits, make all observations almost impossible.

Of two hundred peaks scaled by Coudreau not more than three rise above the forest vegetation, so that from these alone it is possible to obtain a complete view of the horizon and to follow the outlines of the surrounding heights. Of these natural observatories the finest appears to be Mitaraca, a summit 1,900 feet high, terminating in a bare granite cone, which affords not a single tuft of grass to help the climber and save him from a dangerous fall. Nevertheless, Coudreau

Fig. 3.—TUMUC-HUMAC MOUNTAINS.

Scale 1 : 2,400,000.



assures us that the ascent and the unrivalled prospect commanded by Mitaraca is worth the journey from Paris to the Guianas."*

Viewed as a whole, the Tumuc-Humac range is disposed in the direction of the east by south, parallel with the section of the coast comprised between the Maroni and Oyapok estuaries. In the western region the system develops two distinct chains separated by an intervening space of some 25 miles. In the northern chain rises the Mitaraca "belvedere," while the culminating peaks, Timotakem and Temomairem, dominate the southern ridge.

Towards the east the two chains are connected by transverse offshoots, and towards the north they throw off ramifying ridges, which enclose the Maroni basin and separate it from that of the Oyapok. Farther on the eastern section of the system is prolonged in the direction of the east, without, however, forming a continuous divide between the river valleys.

* *Étude de la chaîne des monts Tumuc-Humac*; M.S. Memoir.

At their eastern extremity the Tumuc-Humac mountains ramify like the ribs of a fan towards the north-east, the east and south-east, but retain the aspect of distinct ridges only above the low-lying marshy tracts. About the sources of the Oyapok between these ridges the water-partings are so indistinct that the channels of the Oyapok, Cachipour, Araguari, and even of the Yari affluent of the Amazons, are all connected during the rainy season by continuous chains of meres and lagoons. These shallow expanses, however, are unnavigable and inaccessible even to the canoes of the surrounding Indian tribes.

In that section of the Guianas which is comprised between the southern uplands and the seacoast, there nowhere occur any heights forming continuous chains of mountains or hills. Here all the rising grounds are broken by the fluvial valleys into separate ridges of short length, such as the so-called "Montagne Française" on the right bank of the Maroni; the Magnetic Mountain (715 feet) towards the south-east between the Inini and Mana rivers; and the granitic Mount Leblond (1,335 feet), towards the sources of the Sinnamari.

Near the shore the eminences are for the most part merely isolated masses of gneiss, schists, or sandstone ranging in height from 300 to 720 feet. Formerly washed by the marine waves, they are now surrounded by alluvial matter deposited in the marine waters. One line of beach after another was here laid down, enclosing the old islands and archipelagoes, which are now to be sought in the interior of the Continent.

In French Guiana nothing is seen along the seaboard except a few rocky prominences on the beach or in the vicinity of the coast. North-west of Cayenne a few bluffs stand out near Mana, Iracoubo, Sinnamari, and Kourou. South-east of the capital stretch the hills of Caux, whose French name, as spelt in the eighteenth century, has been altered to the English form Kaw. This range of coast hills culminates in Mount Matouri (836 feet), in the "Tour de l'Ile," south of Cayenne. Mount Argent, serving as a landmark to mariners at the mouth of the Oyapok, is a mere hillock scarcely 300 feet high.

The district known as the "island of Cayenne," though separated from the mainland only by a few marshy channels, is also studded with knolls representing former islands now connected by sedimentary deposits. Such are Cabassou dominating the capital, and farther east the Remire "Mountains," which were formerly called volcanoes. The neighbouring depressions where rise the springs which supply Cayenne with water were similarly regarded as old "craters."

Along the coast occur a few rocky islets, of which the most important, thanks to its deep anchorage, is the Salut Archipelago; farther east are the *Enfant Perdu*; the *Malingre*, *Père*, *Mère* and *Mamelles*, all disposed in a chain parallel with the shore; lastly, farther seaward, the two *Connétables* facing the mouth of the *Approuague*, upheaved peaks of a submarine plateau.

RIVERS OF GUIANA—THE ESSEQUIBO BASIN.

The Essequibo (*Esequebo*), largest of all the Guiana rivers, flows entirely in British territory; but the *Cuyuni*, one of its chief affluents, takes its rise beyond

the Venezuelan frontier. The main stream, like all the other watercourses of this region, appears to bear a native name, in which the final syllable *bo* indicates direction in the Galibi group of languages; hence Essequi-bo would have the sense of "Essequi-wards," in the direction of the Essequi. Nevertheless, Schomburgk refers to a legend which attributes the origin of this name to Don Juan Essequibel or Jaizquibel, one of Diego Columbus's companions.* Formerly the different sections of this great watercourse bore different native names. In the coast region, where it develops a broad estuary, the surrounding populations called it the Aranauma, while the main branch was designated Chip Wa, that is, Chip River, by the Wapisianas and the neighbouring tribes. It would appear to communicate with the upper Trombetas, an Amazonian affluent, through the Apini, a river which, like the Cassiquiare, is said to have a double incline.

Rising in the Awarriwa mountain, the Essequibo, which has a somewhat shorter course than that figured on the English maps of Schomburgk and Brown, flows first north-eastwards through the forest inhabited by a few groups of the Chiriu and Taruma Indians. Farther on it is joined by the Yaore, which flows in a winding course eastwards through the uninhabited wilderness bordering on the savannas. A human figure carved on the face of the rock near a cascade on the Yaore is said by the Indian boatmen to be a portrait of Schomburgk sculptured by the explorer himself, whose name has remained famous amongst the natives; but the effigy is too rudely drawn to accept this legend.

Below the Yaore confluence the Essequibo bends gradually round to the north. Here its bed is still in process of formation; the stream, interrupted by numerous rocky barriers, descends from reach to reach through a succession of cataracts. One of these, bearing the loyal but somewhat eccentric name of "King William the Fourth's Fall," long marked the limit of legitimate trading operations on the upper course of the Essequibo. None ventured beyond this point except the kidnappers who went to capture slaves for the planters of the coastlands.

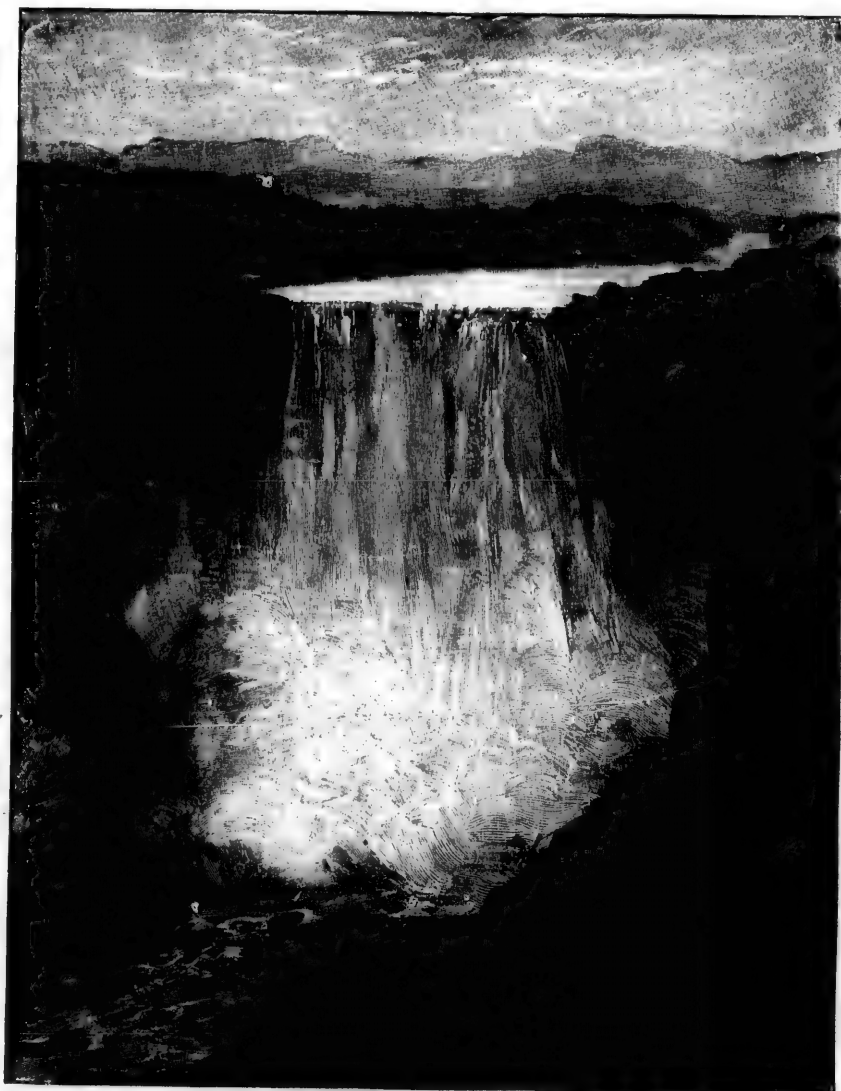
Numerous affluents follow along the left bank of the Essequibo, whose basin broadens out towards the west and contracts to very narrow limits towards the east, from which direction it consequently receives only a few slight contributions. The Cuyuwini, which collects the surface waters of the western savannas, is succeeded lower down by the Rupunini, which is itself joined on its right bank by the copious river Rewa some miles above the confluence with the main stream. The whitish current of this affluent, which mingles with the black water of the Essequibo, offers a navigable route towards the west utilised by the native boatmen to reach the Amazons basin through Lake Amuku and the Pirara river. The only interruption to the waterway between the two systems is a single portage, which is reduced to about half a mile in length during the rainy season.

During this period the flood waters overflow in both directions, on one side to the Rupunini, on the other to the slope drained by the headstreams of the Rio Branco. A great part of this district about the divide between the Essequibo and Amazons basins is occupied by savannas, which would appear to have formerly

* Robert A. Schomburgk, *Description of British Guiana*. Hakluyt calls the river *Dessakebo*.

been the bed of an extensive lacustrine depression, probably the great inland sea celebrated in legend as the Lake Parima where dwelt the "Man of Gold." A

Fig. 4.—KAIETUB FALLS.



tradition still survives amongst the natives that the bed of the little Lake Amuku, scarcely more than a flooded mere, is "entirely lined with gold."*

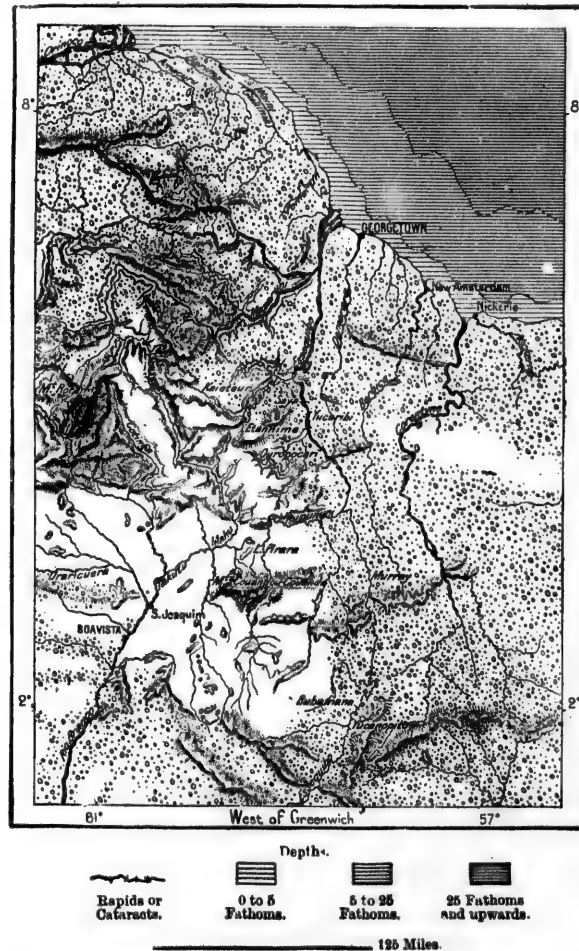
* Gustavo da Suckow, *Geographical Journal*, March, 1898.

THE POTARO AND THE KAIETEUR FALLS.

Lower down the Essequibo is joined by the Burroburro and Potaro rivers, both flowing from the foothills of the Pacaraima uplands, and in their descent tumbling over numerous cascades and rapids. The Kaieteur Falls, formed by the waters of

Fig. 5.—ESSEQUIBO AND UPPER RIO BRANCO BASINS.

Scale 1 : 7,000,000.



the Potaro about the middle of its course, are amongst the finest in Guiana and even in the whole world. Yet their very existence was absolutely unknown to Europeans till the year 1871, when they were discovered by Mr. C. Barrington Brown, at that time engaged on a geological survey of the British Colony. Here

the Potaro is precipitated over an abrupt cliff 741 feet high, and at flood water the fall is 370 feet wide, decreasing at low water to rather less than half that width. During the rainy season Mr. im Thurn compares the spectacle to a vast curtain of water nearly 400 feet wide rolling over the top of the cliff, and retaining its full width until it crashes into the boiling water of the pool which fills the whole space below; but of the pool itself only the outer margin is visible, the greater part being ceaselessly tossed and hurled up in a great and high mass of surf, foam, and spray. The floor of the amphitheatre over which the Potaro tumbles "is occupied by a waste of fallen rocks, made black by constant moisture, but capped with short, intensely green grass, except round the dark stormy pool, where the rocks are entirely bare, slippery, and black. Immediately behind the fall a huge dark cave is visible in the cliff, the upper edge of the cliff serving as a horizon to the whole scene when viewed from below." *

Lower down the Potaro continues still to descend as from step to step through a series of romantic cascades. Formerly the great fall, at that time over 1,000 feet high, stood some 15 miles farther down; but by incessantly eating away the sandstone plateau over which it is hurled down to the plain, it has gradually retreated while diminishing in height. The cornice of rocks from which the river is precipitated consists of a hard conglomerate overlying a more friable sandstone. This sandstone is incessantly eroded by the scething waters of the pool, detaching huge blocks from time to time, and excavating a dark recess beneath the overhanging edge of the plateau. At sunset myriads of swallows, gathering from the surrounding woodlands, sweep the precipice, dart like a flash into the misty spray, and then reappear at the mouth of the cave. Such is the rapidity of their flight that "their wings produce a hissing noise, which is not the least curious phenomenon of this wonderful place. After descending straight down they settle for the night on the face of the cliff, by and behind the fall." †

THE MAZARUNI AND LOWER ESSEQUIBO.

Below the Potaro affluent the Essequibo is almost doubled in volume by the contributions of the Mazaruni, which is itself joined by the Cuyuni eight miles above their common mouth on the left bank of the mainstream. Rising on the highest slopes of the Pacaraima Mountains, where it receives the streams tumbling from Roraima, the Mazaruni is of all the Guiana rivers the most obstructed by cataracts. The falls and rapids occur especially in the lower part of its course, so that, despite its great volume, this river is almost entirely closed to navigation.

At the falls of Chichi, that is, the "Sun," in the Macusi language, the fluvial bed descends a total height of 890 feet (1,380 to 490) in a space of about eight miles. The last obstructions occur at the so-called "Monkey Jump," some 15 miles above the point where the Mazaruni is joined by the Cuyuni.

Below the confluence of the Mazaruni, the Essequibo expands into a broad estuary, which attains a width of no less than 15 miles where it enters the sea.

* *Among the Indians of Guiana*, p. 66.

† *Ib.*

But this great expanse is broken and divided into three main navigable branches by a number of islands, whose long axes are disposed in the same direction as the tidal currents.

The enormous volume of water which is discharged by the Essequibo, and which makes itself felt at a distance of some twelve miles seawards, is explained by the great extent of its catchment basin, combined with an abundant rainfall and the impermeable character of the soil. During the winter season the upper reaches, dammed up by their rocky barriers, overflow their banks in many places, thus periodically restoring the chain of lakes which at one time existed in the fluvial valley.

THE DEMERARA, BERBICE, AND CORENTYNE.

The Demerara (Demerari), formerly Lemdrare, flows east of and parallel to the Essequibo with such regularity that it might almost be taken for a lateral channel, into which were formerly discharged the flood waters of some stream rivalling the Amazons itself in magnitude. Rising amid the northern spurs of the dividing range, the Demerara traverses the same geological formations as the Essequibo, first granite masses, then sandstones with diorites cropping out at various points, and towards the coast broad alluvial tracts strewn here and there with sandhills from 50 to 60 feet high. Sluggish channels and backwaters ramify eastwards, connecting the Demerara with the Mahaica, a river of similar aspect, but of much smaller volume.

The Berbice and the Corentyne (Corentijn), which follow in the direction of the east, also flow in parallel courses quite as regular as those of the Essequibo and Demerara. They develop the same curves and have to surmount the same obstructions by cascades tumbling over rocky granite, diorite, or sandstone barriers. But they vary considerably in length, the Berbice rising far in advance of the dividing range, whereas the Corentyne has its source in the Curucuri mountains away to the south. The latter is already a copious stream at the point where it pierces the rocky hills, in which its western neighbour the Berbice takes its rise.

In this district the Corentyne is joined on its left bank by the New River, through a labyrinth of ramifying branches, and below the confluence the united waters descend to the plains through a series of superb falls and rapids. To one of these, Robert Schomburgk gave the name of King Frederick William the Fourth, as to the corresponding cataract of the Essequibo, which lies under the same latitude, and which presents the same general aspect amid its rugged granite walls.

The Corentyne develops another grand fall at the crystalline rocks of Wonotobo, where three or four branches ramifying into several channels are precipitated from a height of about 100 feet into a lake about a mile wide, from which it issues in a single stream about 1,000 feet broad and 80 feet deep. Beyond this point the Corentyne is entirely free from rapids for the rest of its course of some 170 miles to the sea. But its broad estuary, studded with islands, reefs, and shoals, is of difficult access, and practically closed to vessels drawing more than 10 feet of water.

THE COAST STREAMS OF DUTCH GUIANA.

This estuary also receives the discharge of the River Nickerie from the east. The Nickerie may be taken as a type of the coast streams of Dutch Guiana, developing an irregular but continuous current, which winds sluggishly from east to west through the low-lying alluvial plains. Some of the rivers rising farther inland on the advanced terraces of the dividing range are intercepted on their course to the Atlantic by these coast streams, whose volume they swell, while deflecting them to the east or to the west, according to the abundance of their discharge or the incline of the land. Thus the Upper Nickerie and the Coppename after joining the coast stream continue their seaward course in opposite directions, while between the two winds a channel whose current sets alternately to the right or to the left according to the strength of the river descending from the interior.

East of the Coppename follow the Coesewijne and the Saramacca, which do not communicate directly with the Coppename or its ramifying creeks, although they fall into the same estuary. The lower course of the Saramacca, flowing from east to west, cuts off a strip of coastland, partly bush and partly swamp, which has been completely isolated in the direction of the east as far as the Surinam estuary by an old creek canalised in the seventeenth century by the famous Governor Sommeledyke, and still known as the Sommeledyke Canal.

East of the Surinam, whose bar is accessible at ebb tide to vessels drawing 16 feet of water, the bush and marshy coastlands present towards the sea a long low-lying beach of scarcely perceptible curve, and towards the interior an intricate system of tortuous rivers and creeks with alternating currents. Here and there these watercourses have been transformed to regular navigable canals, largely utilised by the boats and canoes of planters and natives. Thus follow from west to east between the Surinam and the Maroni on the French frontier, the Commewijne, Cottica, Coeremoeribo (Cormontibo), and the Wana or Wane Creek.

The tendency of all the watercourses in this part of Guiana to set in a direction parallel with the coast, as well as the deposit of rich alluvial matter between the watercourses themselves and the present shore-line, cannot be explained merely by the action of the periodical floods. On the contrary, the ocean plays the chief part in the production of these phenomena. The liquid masses rolled down by the Amazons and the Tocantins do not precipitate all their sediment in the great "fresh-water" estuary. Being intercepted by the marine current, the fluvial waters are deflected along the shores of the Guianas as far as the Orinoco, beyond which a portion penetrates through the Serpent's Mouth into the Gulf of Paria.

Thus the alluvial matter brought down by the great Brazilian rivers is distributed along the Guiana seaboard, and in this way beach after beach is successively added to the continental periphery. Most of these new formations become merged in a continuous low-lying coastland, but their regular successive growth is still shown by the intermediate creeks disposed parallel with the shore-line. The fluvial waters of the interior, arrested by the opposing marine current,

are ceaselessly deflected westwards, so as to flow parallel with the ocean stream itself. The alluvial tracts of peninsular formation are thus extended to great distances between the coast streams and the sea, until some weak point here and there suddenly yields to the action of some fierce storm or of an exceptionally high inundation.

In this way has been formed the whole coast system of Dutch Guiana, with its perfectly distinct double shore-line, that may be traced all the way from the Corentyne to the Maroni. These tracts of oceanic origin are still more clearly indicated in that district of British Guiana which lies immediately to the east of the Orinoco delta, and the possession of which is contested by Venezuela. Here the Pomerun river, which reaches the sea at Cape Nassau, the Waini (Guainia), the Barima, and the Amacuru all intersect so many strips of the seaboard that have been built up by the deposition of sedimentary matter in the shallow waters beyond the primitive continental contour-line.

Palgrave, a careful observer of the hydrographic system of Dutch Guiana, describes the rivers of that region as its true highways, "traced right and left with matchless profusion by Nature herself. Broad and deep, tidal too for miles up their course, but with scarcely any variation in the fulness of their mighty flow, summer or winter, rainy season or dry, so constant is the water supply from its common origin, the equatorial mountain chain. They give easy access to the innermost recesses of the vast regions beyond, east, west, and south; and where their tortuous windings and multiplied side canals fail to reach, Batavian industry and skill have made good the want by canals, straighter in course, and often hardly inferior in navigable capacity to the mother rivers themselves. On the skeleton plain, so to speak, of this mighty system of water communication, the entire cultivation of the interior has been naturally adjusted; and the estates of Surinam are ranged one after another along the margin of rivers and canals, just as farms might be along highways and byeways in Germany or Hungary. Subservient to the waterways, narrow land-paths follow the river or trench, by which not every estate alone, but every sub-division of an estate, every acre almost is defined and bordered, while the smaller dykes and canals are again crossed by wooden bridges, maintained in careful repair; but paths and bridges alike are of a width and solidity adapted to footmen only, or at best to horsemen. The proper carriage road is the river or canal."*

THE MARONI, AWA, AND OYAPOK.

The Maroni, the Marowijn of the Dutch, takes the foremost position amongst the secondary watercourses of the Guianas between the Orinoco and the Amazons. Its ramifying headstreams cover a space of nearly 200 miles, on the northern slope of the Tumuc-Humac Mountains, between the Corentyne and Oyapok basins west and east. At present the larger portion of this drainage area belongs to Holland, the whole of the tract lying between the two main branches of the Awa (Lawa) and the Tapanahoni having been attributed to Dutch Guiana by the

* *Dutch Guiana*, p. 71-2.

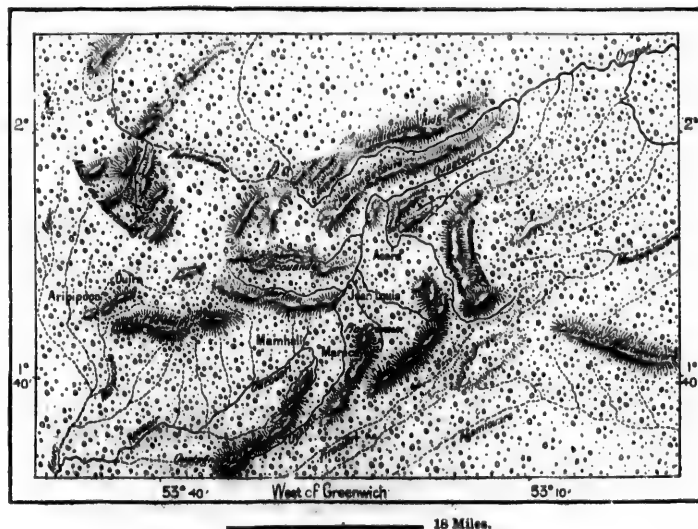
decision of the Tsar, to whom the question in dispute had been referred in 1891.

The Awa or eastern branch, which now serves as the boundary between the conterminous colonies, is supposed to be the more copious of the two headstreams, although the Tapanahoni has the greater winter discharge. Both Crevaux and Coudreau were able to ascend the Awa in boats for a distance of over 300 miles. It has still a width of 60 or 70 feet at the farthest point reached by Coudreau on the Itani, that is, the branch which serves as the international frontier, and whose junction with the Marouini farther east forms the Awa. Immediately beyond this point begin the first rising grounds and steep foothills of the Tumuc-Humac range.

Despite its great distance from the Atlantic, the fluvial bed at the confluence

Fig. 6.—SOURCES OF THE OYAPOK.

Scale 1 : 960,000.



of the two forks is only 650 feet above sea-level; hence in its descent through successive terraces to the coast the Maroni is interrupted by no cataracts of great height. The rocky barriers which at intervals dam up the stream, and which form so many reaches with scarcely perceptible current, have been eroded so as to form a series of natural sluices, through which the river descends in sheets of foam, small cascades, or falls of slight elevation.

At the Hermina (Aramina) Falls, 50 miles from the sea, the Maroni descends a total height of 15 or 16 feet, in a distance of about half a mile. Beyond this point its course is free from all obstruction, and accessible to steamers of some size. Here the river flows between two wooded banks, 3,000 to 5,000 feet apart, and at its mouth forms a bar 16 feet deep at low water.

appropriate to the Amazons than to any other South American stream. Like the Maroni, the Oyapok rises under the name of the Souanre in the Tumuc-Humac Mountains at the Watagnapa Peak, and serves as the eastern frontier of the undisputed portion of French Guiana towards Brazil.

The "creeks" * or headwaters of the Oyapok approach those of the Maroni, and these two rivers closely resemble each other in their general character. The Oyapok also, which was usually followed by travellers bound for Brazilian Guiana, descends from reach to reach through a succession of falls and rapids, which, however, are both more numerous and higher than those of the Maroni. Coudreau speaks of two which plunge over precipices some 60 or 70 feet high, and the *Trois Sauts* ("Three Leaps") is probably the finest in the whole of French Guiana. The Robinson Fall, last of the series, lies about 50 miles from the sea.

THE ARAGUARI, CACHIPOUR, AND MAPA GRANDE.

East of the long alluvial promontory of Cape Orange, which is formed by the deposits of the Oyapok, the whole of the triangular space comprised between this river and the Araguari belongs to the same zone of drainage. Like the Oyapok, the Araguari, the Cachipour, the Cunani, the Carévenne, the Mapa Grande (Amapa of the Brazilians), the Frechal, and the Tartarugal all rise amid the marshy foothills of the Tumuc-Humac range, whence they diverge in all directions like the ribs of a fan.

The Araguari estuary marks the extreme limit of the Guiana seaboard, beyond which immediately begin the waters and islands of the Amazonian basin.

GENERAL CHARACTER OF THE GUIANA RIVERS.

As in Venezuelan and Brazilian Guianas beyond the dividing range, the rivers of Guiana north of that range differ greatly in the colour of their waters. Some, those especially of the savannas, are cloudy and whitish, while others flowing from the woodlands seem black or blackish, although really transparent. In the Essequibo basin the blackish hue of these forest streams is attributed to the roots and branches of the wallaba tree growing in the water along their banks.

Although most of the Guiana rivers traverse continuous woodlands from the mountains to the sea, they are far less obstructed by snags than many other watercourses of the tropical regions. This is due to the great specific gravity of nearly all the arborescent species growing along the margins of the Guiana rivers. Instead of floating, the trees falling into the water through erosion or storms sink to the bottom and rot on the spot.

But on the narrow and shallow upper reaches, the tangle of branches and lianas is a great impediment to the boatmen, who are often obliged to hew their way through with the axe or knife. Here the fallen timber accumulates in *barrages*, the so-called *takuba* of the Essequibo Indians, and the *barrancas* of the Brazilian refugees in the contested territory. Other obstructions are formed by masses of aquatic plants, like the *sudd* of the White Nile, which often present as effectual a barrier to the canoe-men as the falls and rapids themselves. In most of the watercourses

* In French Guiana the term *crique* ("creek") is generally applied to mountain torrents.

the sandstone, granite, or diorite reefs rising to or above the surface are covered, as with a coating of tar, by a film composed of iron and manganese oxides. As on the Orinoco, the harder the rock the blacker the film, which in rainy weather emits noxious odours.

Below the reefs and rapids the broad deep rivers, discoloured and dammed up by the tidal current, roll down a yellowish water often hidden beneath floating vegetation. In their lower reaches these streams merge in the riverside morasses, lakes, or lagoons, which in French Guiana take the name of *pripria*. In the more settled and better-cultivated districts of the British and Dutch seaboard the direction and discharge of the flood waters have been regulated by dykes and canals. On the plantations sluices are used to arrest the tides, while the percolating waters are discharged at ebb through the so-called *kokers*, or ditches. About the estuaries the fresh water of the Guiana rivers floats on the heavier salt water for a distance of six or eight miles seawards.

THE GUIANA LAKES.

Thanks to the uniform slope of the land, the old lakes which formerly studded the surface of Guiana, and whose contours may often still be traced in those of the savannas, have nearly all been discharged. These ancient lacustrine depressions have been best preserved in the contested Franco-Brazilian territory between the Mapa Grande and Araguari rivers.

This lake-studded district lies back of the low-lying peninsular headland of Cape do Norte and the equally low island of Maraca. Within a comparatively recent epoch the zone of fresh-water lagoons extended much farther north all the way to the Oyapok river, and at that time all these lakes, creeks, and channels presented a continuous waterway, over 200 miles between Amazonia and French Guiana, navigable throughout by boats and barges. According to the officers in command of the French fort of Mapa, which was maintained during the years 1836—41, craft of forty tons were still able to follow this route about the middle of the nineteenth century. The Lago Grande, immediately south of the Mapa Grande river, is now a mere fragment of the large sheet of water encircling the island on which stood the French fort abandoned in 1841, and reoccupied by the Brazilians in 1890.

South and south-east of the peninsular Cape do Norte follow other lakes, one of which, Lake Jac, near the Carapaporis Strait between the mainland and Maraca Island, appears to still preserve the form of a spacious bay, but without shelter, hence exposed to the Atlantic storms, and scarcely any longer navigable by the native boatmen.

The Lago Novo, near the Araguari river at the southern extremity of the lacustrine chain, also resembles a marine inlet, and even affords a retreat to manatees, which here browse on the forests of aquatic plants. But it is also accessible to barges, which find shelter from the Atlantic gales under the lee of the insular groups which form so many transverse breakwaters. Having a depth of from 30 to 40 feet, this basin might easily be transformed to a magnificent

harbour of refuge spacious enough for whole fleets, by deepening the channel a few miles long with which it communicates with the Araguari, and dredging the estuary which has silted up, presenting in some places depths of little over three feet.

The subsidence and entire disappearance of the Guiana lakes is a process which is accomplished very rapidly. The reeds and other plants which wither in summer are deposited in a bed of floating humus in which various vegetable species and even shrubs strike root. These verdant carpets are from time to time rent by the storms and driven to the surrounding margins. Here they are soon again massed together and thickened. Thus the lake becomes gradually filled in, or transformed to a floating quagmire, firm on the surface, boggy in the lower depths. In a short time nothing remains of the lagoon except the navigable channel, the *igaraapé*, or "canoe track." Coudreau even hazards the theory that the lakes are emptied by a kind of see-saw movement of the banks.*

In several of the lacustrine beds have been found huge trunks, whose origin it is difficult to explain, except on the supposition that the lakes were at first dry land, which afterwards subsided through some sudden disturbance of the ground. Another explanation of the phenomenon, however, is suggested by the form and trend of the seaboard. The alluvial promontories at the Oyapok, Approuague, and Cachipour estuaries are all disposed in the direction of the north, and in their lower course these rivers also follow the same direction, evidently under the influence of the marine current, which deposits its sedimentary matter along the shore. It may therefore be assumed that at contact with this current the Araguari was also deflected northwards, and that the chain of lakes which have the same trend are the remains of the old fluvial bed.

The Carapaporis Strait, which flows between Maraca Island and the mainland, and which is clearly distinguished by its greater depth from all the surrounding shallow basins, would on this hypothesis be the old mouth of the Araguari, scarcely modified since the time when the river reached the sea more to the east. If so much be allowed, there would be nothing surprising in the fact that, like the Amazons, the copious Araguari should float down large trees and deposit them along its lower winding course, which afterwards became a system of lagoons connected together by tortuous channels. In the same way the marine current itself intercepts the snags washed down by the Amazons, depositing them along its muddy course, where they afterwards become embedded in the alluvial coastlands of more recent formation. Such ligneous deposits have been found at depths of 78 or 80 feet.

But however this be, great changes have been in progress even during the contemporaneous period. A mere glance at the map suffices to show that the seaboard of the contested Franco-Brazilian territory between the Araguari and the Cachipour presents a striking contrast to the section of the coast running east and west between Cayenne and the Corentyne estuary. This section develops a regular convex curve, indicating the incessant deposit of sediment by the marine

* *La France Équinoxiale, Voyage à travers les Guyanes et l'Amazonie.*

current. But the southern section has, on the contrary, been deeply eroded by the marine waters; a portion of the old shore has been washed away, and the Cape do Norte, as well as Maraca Island, are so many fragments of the ancient continental seaboard. Along the whole length of the coast of Dutch Guiana east and west of Paramaribo, the existence of older beaches may be traced by the lines of snags deposited by the marine current and now embedded in the littoral alluvia.

Analogous contrasts are presented by the character of the coast streams in both regions. Off the shores of Dutch Guiana the soft mud covering the bed of the sea yields like a movable carpet to the action of the Atlantic billows, and thus tends to diminish their force. Thus the rollers gradually subside until the sea becomes quite smooth, so that vessels often find safe anchorage between the marine current and the shore while the storm rages on the high sea.

About the Cape do Norte and Maraca Island, on the contrary, the tides rush in with extreme violence. Nowhere else, not even in the Amazonian estuary, does the *pororoca*, as the bore is locally called, roll up more suddenly, or with a succession of more powerful waves. So far back as 1743 La Condamine had already described the waters about the Araguari estuary as amongst the most dangerous for shipping. The tides, pent up in the narrow gulf on a gradually shoaling bed, rise in a few minutes to one-third of high water level; they have occasionally been observed to rise almost suddenly as many as 20 or even 26 feet. The floods spread far over the low-lying coastlands, and during the spring tides, when there is a rise of from 40 to 50 feet, whole strips of the mangrove-covered beach have been swept away. These verdant islands, drifting with the current, are stranded farther north about the Cachipour and Oyapok estuaries. Even at neap tide the difference between ebb and flow in these waters is still about 10 feet.

Subjoined is a table of the chief Guiana rivers between the Orinoco and the Amazons, with approximate estimates of their length, areas of drainage, discharge, and extent of navigable waters for small steamers:—

	Length in miles.	Area of basin in square miles.	Mean discharge per second in cubic feet.	Length of navigable waterway.
Essequibo	620	64,700	70,000	40
Demerara	175	3,000	7,250	94
Berbice	325	14,000	18,000	165
Corentijn	450	23,000	35,000	70
Surinam	300	14,000	18,000	96
Maroni	390	23,000	39,000	46
Approuague	190	4,000	2,700	38
Oyapok	300	12,000	26,000	46
Cachipour	320?	8,000	14,000	60
Cunani	175?	4,000	7,250	44
Araguari	310?	9,500	14,000	125

At a distance of from 15 to 50 miles off the coast flows the great marine current, which sets from Cape S. Roque towards Trinidad. Its axis extends on an average 134 miles from the mainland, and its total breadth may be estimated at from 230 to 250 miles. It varies in velocity with the winds, at times exceeding 90 or 95 miles a day, while at others, when retarded by the trade

winds, it moves at scarcely more than a mile an hour, and even develops lateral counter-currents and whirlpools. At such times it rises in the harbours along the seaboard like a fluvial current above the weirs.

CLIMATE OF THE GUIANAS.

The Guianas lie entirely within the zone of the north-east trade winds. Nevertheless they are sufficiently near the equator to come within the influence of the prevailing south-easterlies for a part of the year. At Cayenne, which may be taken as the central point of the Guiana seaboard, the normal wind, setting usually from the north-east, blows regularly from the beginning of December, and acquires its greatest force in January and February. At the spring equinox its fury abates a little, and then follows the period of calms interrupted by squalls, while in the month of July the general shifting of the atmospheric currents towards the northern hemisphere is indicated by the steadily increasing south-easterly breezes. Nevertheless, these south-easterlies, or rather east-south-easterlies, do not blow continuously; they prevail usually at night, being replaced during the day by the land breezes. The Guiana seaboard lies entirely beyond the sphere of the cyclonic storms.

The period during which the north-easterly trade winds prevail corresponds to the rainy season, which usually sets in with the normal winds, and lasts till the period of irregular breezes and of the dry south-easterlies. In March the rainfall is least abundant, whence the expression, "March Summer," which is applied in French Guiana to this relatively dry month. But in May the moisture-bearing clouds discharge their contents in cataracts, and these heavy downpours are known as the *Pluies de la Poussinière*, "Pleiades Rains." On the Guiana seaboard the mean rainfall exceeds 100 inches, and in some years the rain-gauges have registered over 160 inches,* while Mr. im Thurn records a downpour of no less than 13 inches in twelve hours.†

But the precipitation varies greatly from year to year, rising at Georgetown, for instance, from a little over 60 inches in 1885 to double that quantity in 1890. During the rainy season the temperature is slightly lower than in summer; but it never varies more than a few degrees from the normal for the whole year, which may be taken at about 80° or 81° Fahr. In the interior, the range between the extremes is slight, thanks to the uniform relief of the land, which presents no great elevations except in the Pacaraima uplands. But the greatest differences are observed in the distribution of moisture. Thus the rain-bearing clouds intercepted by the mountains discharge their contents in torrents on the higher summits, whereas they part with but little of their humidity on the plains, where they meet with no obstacles.

But even here the atmosphere is nearly always charged with a large quantity of aqueous vapour. At dusk the fogs spread like a vast shroud over the woodlands, where they are often pierced by the large trees, whose crests rise above the

* Rainfall of Cayenne in 1874: 168 inches (Maurel and Hardy).

† *Journal of the Colonial Institute*, 1892—93.

dense haze like rocky islets in the midst of the sea. The plains, the headlands, everything is wrapped in this damp covering, with which are intermingled the miasmatic exhalations of the soil. On the Tumuc-Humac Mountains, where in the space of five months Coudreau made over fifteen hundred observations, the atmosphere is less charged with moisture than on the coastlands. "Here the fogs are drier, and the night temperature falls to 16 degrees" (61° Fahr.).*

FLORA OF THE GUIANAS.

To the irregular distribution of the rainfall must be attributed the striking contrasts presented by the flora of the Guianas. There are two distinct botanical zones—the savannas, or *campos*, as the Brazilians call them, and the primeval woodlands. But account must also be taken of various sandy and arid tracts destitute of all vegetable humus, and of other districts, where, despite the moisture, arborescent plants are prevented from springing up by the dense forests of reeds.

The treeless regions extend for the most part below the hills or mountains, whose upper flanks are exposed to constant rains. Thus in British Guiana the upper Takutu basin, sheltered from the moist winds by the eastern offshoots of the Pacaraima range, lies altogether within the zone of savannas. But certain plains in close proximity to the Atlantic coast are completely destitute of forest growths, although in their geographical position and absence of relief they closely resemble other well-wooded plains. Thus in the contested Franco-Brazilian territory the savannas, interrupted only by fringes of trees along the river banks, extend parallel with the Atlantic coast all the way from Cape Orange to the Amazon estuary, and nearly the whole of the lower Araguari valley forms a vast treeless campo.

In British and Dutch Guiana, the savannas form a narrow belt of open ground reaching from the banks of the Demerara to those of the Surinam. The existence of these treeless tracts between the mangrove-covered littoral and the inland forests is due partly to a local disturbance of the moist winds, partly to the nature of the soil, formerly the bed of a lake.

Like the Venezuelan llanos, the savannas of Guiana present the whole series of transitions from a wooded to a grassy surface. In some districts the limits of the different zones are as sharply defined as those of land and sea formed by vertical cliffs. On emerging from the virgin forest with its tangle of lianas and parasites, the wayfarer suddenly finds himself surrounded by a sea of herbaceous growths, where the eye sweeps unhindered over a vast horizon limited in the distance by a sky-line of mountain crests. Elsewhere the woodlands break into an irregular fringe of glades, distribute their trees more openly, and lower their height, scattering clusters of wooded islets round about their verge.

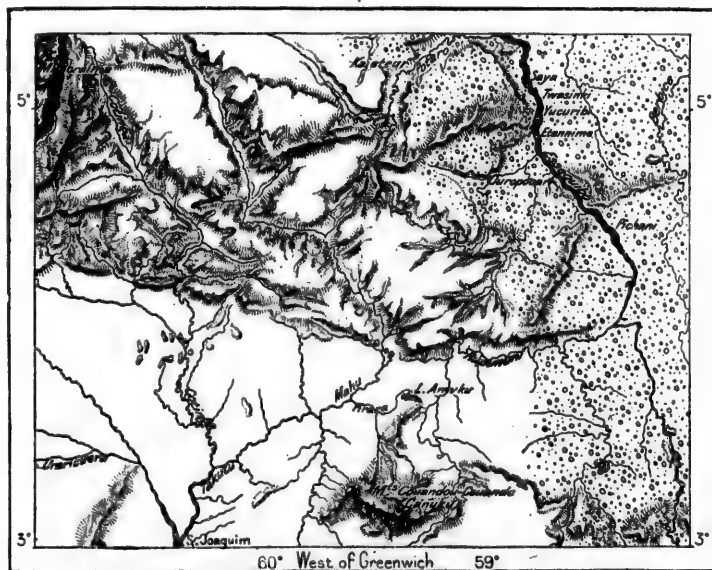
* Meteorological conditions of the Guiana seaboard :—

	Mean Temperature.	Highest Temperature.	Lowest Temperature.	Rainy Days.	Rainfall.
Georgetown	81° F.	90° F.	74° F.	170	119 inches
Paramaribo	79°	96°	70°	177	140 "
Cayenne	80°	92°	72°	160	130 "

The savanna also present analogous differences. Some, especially in the neighbourhood of the dividing range between the British and Brazilian Guianas, are entirely destitute of arborescent vegetation, and these the Brazilians call *campos limpos*, "savannas proper." But in most of the Guiana prairie lands are seen a few trees, either scattered or disposed in rows. Every winding stream has its fringe of forest growths; every brook and gorge has its screen of *Mauritia* palms, regular colonnades, whose capitals are formed of 10 or 12 pendent fan-shaped leaves, the resort of whole flocks of parrots. Where the watercourses ramify into a multitude of channels, the savannas are decomposed into as many secondary prairies with intervening screens of the same palms, or of other trees,

Fig. 8.—TAKUTU SAVANNAS.

Scale 1 : 8,200,000.



resembling the long lines of poplars which border the meadowlands in the Loire valley.

The general aspect and the vegetation of the savannas are modified with the varying quantity of atmospheric moisture or the greater or less aridity of the soil. In the neighbourhood of the sea and of the coast streams or creeks, the pripris or swampy tracts have somewhat the character of the savannas proper. They dry up in summer when the ground yields a scanty growth of grasses, continuing seawards the surface of the arid inland prairies. In French Guiana most of these swamps take the name of *pinotières*, from the *pinot* palms (*assai* or *euterpe edulis*), which border their margins.

As the ground rises towards the interior, the savannas become clothed with various grasses and leguminous plants analogous to those of the European meadows. Pale green during the rainy season, they assume a russet or a yellowish garb in summer; but they are for the most part destitute of flowering species. They nowhere array themselves in bright colours, nor do they emit the fragrance peculiar to the flowery meads of west Europe. But what they chiefly need is the aid of man in developing a more extensive growth of alimentary plants. From the results of the few agricultural clearings that have been made, especially for fodder crops, some idea may be formed of the natural fertility of these regions.

With few exceptions, the inhabitants contribute little to modify the flora of the savannas beyond the rough-and-ready process of firing the withered grasses in the summer season. The object of these conflagrations is merely to collect a few turtles amid the embers. No attempt is made to improve the pastures, and on the high lands beyond the alluvial tracts, the fires have in many places consumed plants, roots and all, down to the sandy subsoil. A few arid heights, whose underground recesses are the resort of huge lizards, have already here and there assumed somewhat the aspect of sandhills. The fire, under the influence of the winds, is at times propagated with great rapidity, but as a rule it spreads much slower than in the Algerian bush or on the prairies of the Far West in North America. The plants, containing more moisture, are less inflammable, and the conflagration is usually arrested on the verge of the forests after devouring a few of the more exposed trees. Even in the savanna itself it spares the verdant clusters which are formed round about the springs, and which afford cover to the animals during the summer heats.

The Guiana forests, which on the eastern slopes occupy by far the greatest part of the whole region, belong to the Amazonian botanical world. Nearly all the species of the *selea* are represented in the Guiana woodlands, which nevertheless form but a relatively small division of the continent.

Instead of monotonous forests consisting mainly of one or two sociable plants, such as the European or North American pine, spruce, oak, or beech groves, this region possesses a vegetable world characterised by the prodigious variety of its forms. French Guiana alone presents as many as 260 forest species, that is to say, 10 times more than are found in France itself.

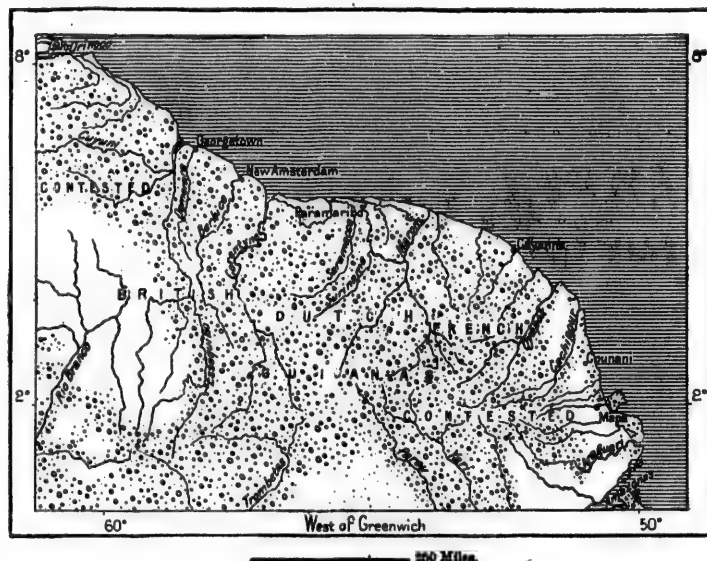
The marine current setting from Cape S. Roque along the Brazilian seaboard round to the Guianas certainly contributes its share to the distribution of the southern forms by the seeds, fruits, and branches which it casts up along the seaboard. But all the vegetable treasures of Guiana are still but approximately known, some regions not having yet been visited by any naturalists.

Nevertheless, the itineraries followed by botanists already cover most of the ground. In 1872, Grisebach estimated at 3,500 the number of species described up to that date. The most widespread families are those of the leguminous type, which represent about a ninth part of all the local forms. Next to them the most numerous are the ferns and orchids. The palms, of which as many as 30 varieties occur in French Guiana alone, comprise about the hundredth part of the

whole flora; but their majestic appearance, making them conspicuous objects at a distance, gives them a seeming importance far beyond their mere numbers.

The members of the Venezuelan and Colombian zones, which are not found in Guiana, are mainly the Alpine plants flourishing in the Andes at altitudes much higher than the summits of the Pacaraima and Cuirrit ranges. At least 200 varieties of tree ferns grow on the slopes at heights of over 3,000 feet; in a few days Richard Schomburgk discovered as many as 93 different members of this family in the Roraima district, which has been called the "Eldorado of botanists." Here the slightest difference of relief, aspect, or soil is marked by fresh forms. The *bejaria* (*bejaria*), or "rose of the Andes," and a plant allied to

Fig. 9.—FORESTS AND SAVANNAS OF GUIANA.
Scale 1 : 12,000,000.



the cinchona, are also represented on the slopes of Roraima. On the banks of the Essequibo the Indians make use of arrows obtained from a poisonous bamboo, which produces the same effect as the curare.*

The superb *Victoria regia*, discovered in 1837, in the Berbice River, British Guiana, and afterwards met in many other watercourses in the Amazonian region, is an example of the marvellous beauty that efflorescence may assume in equatorial America. In some places the surface of the lakes almost entirely disappears under a carpet of enormous leaves and tufts of white petals intermingled with other flowers, blue, pink, or yellow, and with quaking grasses. Under certain favourable atmospheric conditions, the flowers of a nymphaeacea abounding in these fresh-water basins shine with the calm glow of a night light, much less vivid

* C. B. Brown, *Canoe and Camp Life in British Guiana*.

than that of tropical fire-flies and of other luminous insects, but brighter than that emitted by decaying timber.

Amongst alimentary plants are the wild cacao, several varieties of edible passionworts, wild pine-apples, some sap-yielding palms, the marantaceæ from which arrowroot is extracted, the twelve varieties of manioc, the euphorbiaceæ from which cassava, coac, and the so-called paiourai beverage are prepared, the carambola (*averrhoa* c.), the tuka (*bertholetia excelsa*), whose fruit, resembling a cannon ball, and about the size of a man's head, contains in four cells six or eight of the excellent Brazil or Para nuts.

The "traveller's tree" of Madagascar is represented in the Guianas by the *rarenala guianensis*, a wild plantain with enormous leaves shooting up from near the ground to a height of 10 or even 15 feet. "The bases of the leaf-stalks" sheath the one over the other, and in the pockets formed by each of these sheathing parts much rainwater is retained even through the dry season. Another noticeable feature in these plants is that the seeds within the tough thin shell of the fruit are packed in a large quantity of short fibrous substance like clippings of wool, in the Guiana species of brightest scarlet colour, but in the Madagascar plant of blue.—(*Im Thurn*.)

In the coast region are met the oleaginous, medicinal, resinous, and aromatic species of Amazonia, and room might still be found for all those of equatorial Africa. The awara (*attalea speciosa*), a member of the palm family, yields an oil as valuable as that of the Guinea oil-palm, which was introduced into Guiana in 1806. Other kinds, such as the *carapa guyanensis*, whose nuts contain as much as 70 per cent. of their weight in oil, the wax-tree (*virola sabifera*), and the incorruptible wapa (*tamarindus indica*), also offer industrial resources hitherto scarcely utilised; the same may be said of the 150 species and upwards of medicinal plants, all containing valuable properties in their wood, sap, roots, leaves, flowers, or fruits.

Amongst the caoutchoucs and others yielding gums and rubber of the gutta-percha type, noteworthy is the balata (*achras* or *mimusops balata*), the "bullet-tree" of English writers, whose sap is at once elastic and ductile. Like Arabia, Guiana has also its incense tree, the hyawa (*icica heptaphylla*), which is burnt in the churches on the coastlands. "Where the hyawa tree grows, the whole air for some distance round is pleasant and wholesome with the incense-like odour of the white resin that drops from its stem and falls in masses on the ground; and a still more powerfully-scented resin, which coats the trunk of another tree, the tauranero of the Indians (*humirium floribundum*, Mart.), seems to imitate and surpass the odour of vanilla."—(*Im Thurn*.)

The natives have brought to the notice of the whites numerous dyewoods, such as the rucu and the lena (*genipa americana*), and others abounding in tannin. With the fibres of hundreds of plants, from the palm to the pine-apple, they weave a thousand different textile fabrics, which are used for endless purposes. Altogether this region holds in reserve a prodigious storehouse of raw materials, all available for the industrial arts.

Guiana also abounds in timber and cabinet woods, which it is to be feared

may soon attract the attention of those reckless speculators who have already wasted so many woodlands. The *mora excelsa*, a leguminous tree, which overtops all other forest growths, shooting up to a height of 120 or 130 feet, exceeds the oak and even the teak in elasticity and durability; it is unsurpassed for ship-building, and in economic value is rivalled only by the green-heart ebony (*neeltandra Rodiei*).

Dozens of forest trees are met which possess more solidity than the oak, but their specific gravity is for the most part equal to or even greater than that of water. During the last century some of these heavy woods were used for making mortars and gun-carriages. The species suitable for cabinet work are noted for their bright green, yellow, grey, or black tints, their mottled, marble, or satin-like surface. One species which shows in section a lovely spotted brown grain has taken the name of "tiger-wood" from its resemblance to the spotted skin of the American tiger (jaguar). Another is the letter-wood (*brosimum Aubletii*), so called from the deep colour of its surface, on which are inscribed black figures resembling hieroglyphics.

FAUNA OF THE GUIANAS.

In its fauna, no less than in its flora, Guiana forms a land of transition between the Amazonian zone and those of the Venezuelan seaboard and of the West Indies. None of its mammals, saurians, or reptiles belong to it exclusively; and if some of its birds, insects, or other smaller organisms have not hitherto been met elsewhere, it may be almost taken for granted that such forms do also occur in the conterminous regions possessing the same climate, soil, and vegetation.

The species usually spoken of as specially characteristic of the Guianas are those that naturalists have first observed in this region. Such are the marsh or mangrove deer (*cervus palustris*), which frequents the swampy districts; the crab-eater (*canerophagus major*), which preys on crabs and builds its nest in the banks of the creeks; the grey crane (*grus ferricincta*), with the digestion of an ostrich, and nearly as tall; of aquatic fowl, such as duck, flamingoes, herons, ibis, there is a great variety, gathering at times in flocks of thousands. The *tyrannus sulphureus*, most common of all birds, whose voice is heard in every tree, has from its peculiar note received in French Guiana the eccentric name of *Qu'est-ce qu'il dit*, contracted to *Kiskadi*. In the depths of the forest is often heard the metallic note of the so-called bell-bird (*campanero*), of which there are two varieties (*chasmarhynchus carunculatus* and *C. variegatus*). But Mr. im Thurn "never could detect much resemblance in the note of these birds to the sound of a bell. The cry of the first species is more like the ring produced by two pieces of iron struck against each other; but the notes of the male and female birds differ considerably. The cry of the second species is like the sound made by the drill in blasting operations. Then also in the forest is heard an extraordinary deep sound, like the lowing of an ox, and it is long before the traveller realises the fact that this is made by the 'quow' or 'calf-bird' (*gymnocephalus calvus*), a bird no bigger than a pigeon."

In British Guiana the great cayman is confined to the upper courses of the Essequibo and Berbice rivers; nor does it occur anywhere in Dutch or French Guiana, though it is again met in the Franco-Brazilian contested territory. The rivers of Dutch and French Guianas are frequented only by two small species of alligators.

Nearly all the snakes are harmless to man; the small number of venomous serpents take the collective name of *grages* in Cayenne, where they are often met in a torpid state. Some of the boas, especially those of aquatic habits, such as the water camoodi (*eunectes murina*), acquire enormous dimensions. According to Kappler, one killed on the upper Surinam river measured over 43 feet, and Mr. Im Thurn's companion shot one in the Potaro river which "proved to be 20 feet in length and three feet in girth at the thickest."

The gigantic low-low, a silurian found in the Essequibo, and much appreciated by the natives, exceeds ten feet in length, and weighs as much as 220 pounds. The pirai or perai (*serasalmu niger*), whose bite is justly dreaded by man, swarms in most of the rivers, and is probably one of the most voracious animals in existence. They not only snap off the feet of ducks and the tails of iguanas, but will even attack alligators, who "do not always escape with whole tails. A perai itself, if wounded by any chance, is at once attacked and devoured by its fellows. If a monkey or bird, when shot, falls in the water, perai rush together from all quarters and carry off the prey before the sportsman can reach it; and more than once, when fishing in clear water, the bait having been taken by some other fish, I have seen the captive, as it was pulled through the water towards the boat, pursued and snatched by rushing perai."—(Im Thurn.)

The Guiana Indians are rare experts in domesticating wild animals, such as the agamis (*psophia crepitans*), cranes, hoccoes (*crax alector*), parrakeets, dogs, aras, and even jaguars. The stranger arriving suddenly near a native homestead is liable to be attacked by these "pets," and unless the owner comes to restore order, he will have much difficulty in reaching the cabin. Of the two species of wild dogs in British Guiana, one, the *maikang* of the natives, commits great depredations on the plantations. These carnivora prowl about in large packs at night, penetrating through the enclosures without giving tongue, and playing havoc with the poultry and other farm-yard animals. The *maikang* crossed with the common species produces an excellent breed of hunting dogs, which fetch large prices in Georgetown.

INHABITANTS OF THE GUIANAS.

All the Guiana Indians are collectively grouped by the English and Dutch settlers under the respective names of *bucks* and *bocks*, terms which, in a sense, assimilate them to the beasts of the field. During the early colonial times the Europeans, ignorant of the different languages and usages of these aborigines, were naturally inclined to regard the various groups as so many distinct "nations." Thus Barrère in 1743 enumerates over forty of such groups in French Guiana alone, without attempting to classify them according to their mutual affinities.

But these ethnical affinities were gradually recognised, and the studies of the missionaries and philologists have now reduced all the indigenous populations of Guiana to three independent families: *Arawak*, *Carib*, and *Tupi*. Even these groups, however, present many points of resemblance in their appearance, physiognomy, and customs, while differing greatly in speech.

THE ARAWAKS.

The oldest group, constituting the aboriginal element in the strictest sense, appears to be that of the Arawaks, a name which has been referred with great improbability to a Tupi word meaning "porridge-eaters." All the natives alike, as well as the Creoles, live on a manioc diet, so that the Arawaks are not specially distinguished in this respect. They are met, all bearing the same name, everywhere throughout the British Guiana seaboard, and under different designations in the inland districts; here they usually call themselves Lokono (Lukkunu), that is, "Men."

The Wapisianas, Tarumas, Atorais (Atorradi) of the upper Essequibo and of the Takutu, and the Palicurs of the contested territory, all belong to this primitive group. At the time of Schomburgk's journey the Amaripa tribe, formerly neighbours of the Wapisianas, were already extinct, represented only by a single survivor, a woman sixty years old. The coast Arawaks, living in the midst of the whites and of other settled populations, with a sort of English jargon as their common medium of intercourse, have all been Anglicised, and are gradually merging in the somewhat cosmopolitan neighbouring class employed on the plantations. Under the Dutch rule these Arawaks were freed from the servitude "legally" imposed on all the other Indians.

Those of the Moruka coast stream north-west of the Essequibo estuary are not full-blood Arawaks. During the Venezuelan War of Independence some Orinoco Indians belonging to an unknown tribe, but already largely Hispanified in their usages, took refuge in British Guiana, in order to escape from oppression and massacre. Here they received a concession of some land in the hilly district about the sources of the Moruka, where they settled, cultivating the soil, intermarrying with the Arawaks, and thus reverting to the Indian type. Later some Portuguese immigrants mingled with these half-breeds, while the discovery of the gold mines brought them in contact with the cosmopolitan populations of the auriferous districts.

Till recently the Arawaks, who have their camping-grounds on the banks of the Aruka, a western affluent of the Barima, kept completely aloof from the whites, and of all the natives these alone were unfamiliar with the English language. As amongst the Caribs of the West Indies, some traces of bilingual speech have been discovered amongst them, a phenomenon which can only be explained by the intermingling of two races as the result of conquest.

The Arawaks have preserved many of the old national usages, amongst others certain tests of endurance, such as the whip-game or dance, in which the dancers, all being men, "stand in two rows opposite each other. Each man has in his

hand a whip with a hard strong lash made of fibre. Every now and then a couple retire from the line and use their whips. One stands steadily, one leg in front of the other; the other swings back his whip, and, with all the force he can command, lashes the calf of the first man's leg. Then in his turn the second man stands still to receive a lash from the other. They lash each other in this way until their calves are striped with weals and blood flows freely. The punishment is borne and inflicted with perfect good temper, and was probably originally devised as a test of endurance. Finally the dancers retire and drink together."—
(*In Thurn.*)

These Arawaks appear to have been by far the most civilised of all the Guiana peoples, for they possess fictile vases of most varied forms embellished with ornaments and grotesque human and animal figures in high relief. The pottery of other Guiana tribes is extremely simple, without any decorative work beyond a few rude designs executed in thin lines. To the Arawaks should perhaps be attributed the stone porringers met in several parts of the Guianas, the circle of standing stones seen by Barrington Brown in the Pacaraima Mountains, and resembling that of Stanton Moor, the *timehri* or inscribed rocks of the Berbice, Corentyne, and Maroni rivers, covered with figures of men and animals, especially frogs, together with other eccentric forms, some shallow, some deeply incised.

THE WAPISIANAS AND ATORAIS.

The Wapisianas and Atorais, who dwell about the region of the water-parting, being rarely visited by the English travellers, have still preserved their primitive type. The Atorais would probably be the losers by miscegenation with other tribes, for their women are distinguished by remarkably perfect figures and great dignity of expression. The profile of the face differs little from that of Europeans, and the complexion is almost white. According to Coudreau, many of the Atorais are no darker than the Andalusians, the Sicilians, or the peasantry of South France.

On the other hand, the Wapisianas are of a browner colour, with less regular features and less graceful carriage. Like the Atorais, they have a hairless face with only a few short bristles on the upper lip and chin, while the hair of the head is very abundant. Both sexes pierce the lower lip with at least two pins, and insert another in the cartilage of the nose, to which they attach a piece of metal. This, it would seem, is the distinctive mark of the tribe. Formerly the Wapisiana girls were obliged to have the two upper incisors extracted; but this custom appears to have fallen into abeyance.

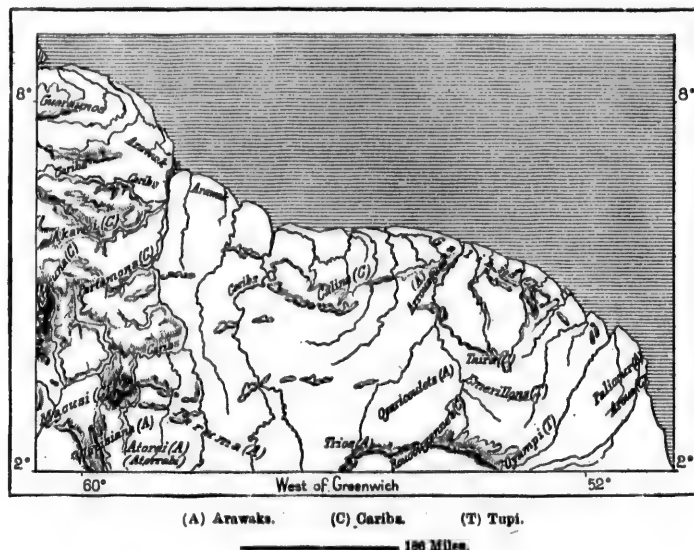
These natives wear nothing but the calembé, the loin-cloth of the negroes; but they pay great attention to the head-dress and other personal embellishments, decking themselves with all the beads, coins, and trinkets they can pick up. Maize is grown, but only to extract from the grain a kind of beer, called cashiri, which throws the drinkers into a state of hilarious intoxication. It is during these orgies that the young men's brides are usually carried off, marriage being still made amongst the Atorais and Wapisianas by abduction.

Like most other Guiana tribes, the Wapisianas practise the strange custom of *couvade*. Throughout the region of the divide between the Takutu and Essequibo basins, their language has become the chief medium of trade and general intercourse between the surrounding groups, even those of Carib origin. The Atorais, or at least the men, have almost completely given up their own in favour of the soft and sonorous Wapisiana tongue, which, being highly vocalic, is well suited for oratory.

Amongst the indigenous tribes connected with the Arawaks should perhaps be included the Warraus (Guaraunos) of British Guiana, who have their camping grounds in the wooded alluvial tracts of the north-west, and who have partly adopted Christianity. Scarcely differing from those of the Orinoco delta, they live

Fig. 10.—INDIANS OF THE GUIANAS.

Scale 1" = 11,000,000.



like them in cabins built and entirely furnished with the wood, leaves, and fibre of the *Mauritia* palm, from which plant they also procure their clothing, food, and drink. The Warraus never perform any ablutions, in this respect differing altogether from most of the other natives, who take great delight in bathing.

When there are any family disputes to settle, the tribe gathers on some sand-bank, where the men of all ages range themselves in two opposite rows armed with shields made of the *Mauritia* palm. Then all advance, each facing an opponent and watching his opportunity to spring forward and thrust him back. The shields now meet and clash, the two antagonists planting one foot firmly on the ground, and pushing with the knee of the other leg with might and main against his opponent's shield. Whoever succeeds in forcing the other back from his position

is deemed to have gained the case in dispute, which is accordingly settled in favour of the side which has proved most successful in this wrestling match. All the Warrau women, says Richard Schomburgk, have a profoundly sad and indescribably soft physiognomy.

THE CARIBS.

The Carib (Caraïb) division has representatives in every part of the Guianas, and some of the tribes even bear the general name of the whole family. One of

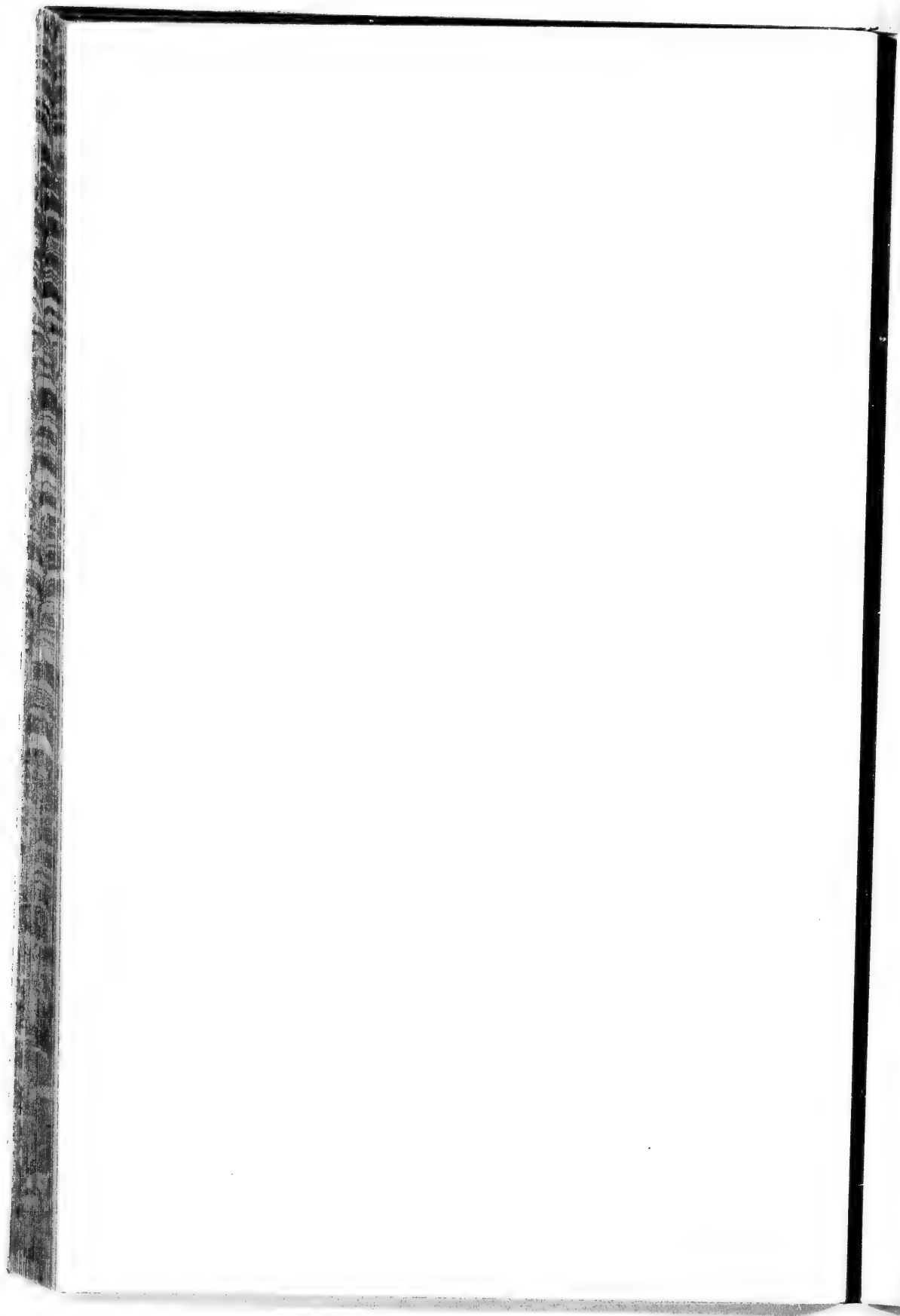
Fig. 11.—GALIBI MAN.



these groups is settled at Warramuri, west of the Moruka estuary, close to an enormous shell mound and other kitchen refuse, attesting a long sojourn of several centuries in the district. To these natives Everard im Thurn gives the distinctive name of "true Caribs," on the assumption that they landed here on their arrival from the West Indies, supposed by him to be the original home of the race. This view is so far confirmed by certain legends bringing them from the north, while



GALLET HABITATIONS ON THE BANKS OF THE MARONI.



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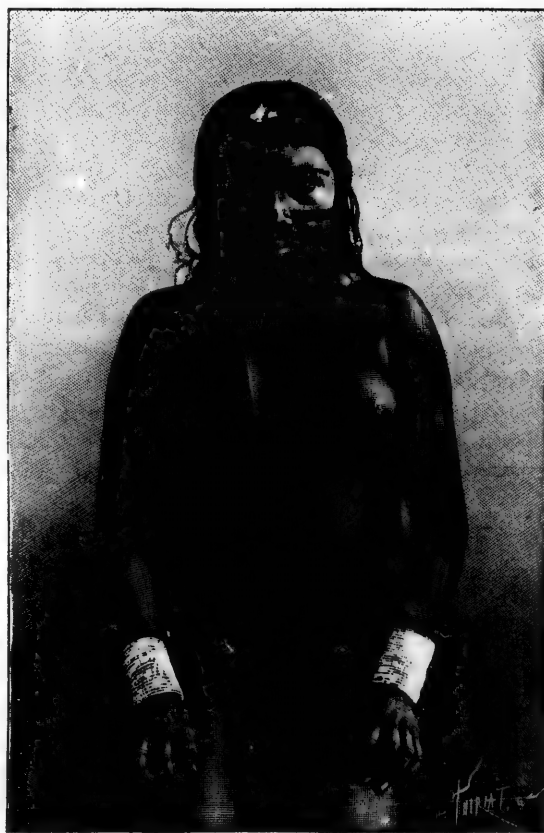
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the Caribs themselves claim to have descended from above through a hole in the sky.

But most American ethnologists look on the central regions of Brazil as the most probable cradle of the Carib race, in which case the expression "true Caribs" would be more applicable to the tribes dwelling in the interior of the Guianas than to those now settled on the seaboard. The Galibi of French Guiana, who are also of pure Carib stock, and who even bear this name under a somewhat more euphonious form, have occupied the coast zone west of Cayenne for at least

Fig. 12.—GALIBI WOMAN.



two centuries and a half. Here they had some twenty villages in 1652, and at present some of their settlements are scattered along the Sinnamari and Iracubo rivers, and especially along the right bank of the Maroni.

Another Carib people, the Calinas, remnant of a great and powerful nation, have held their ground in the Surinam valley. To the same stock belong the famous Roucouyennes of the interior, who are so named by the Creoles from the

roucou (rucu) with which they paint their bodies, but who call themselves Wayana, perhaps another form of the word Guiana.

The fine Akawoi (Waika or Kapohn) Indians of the mountainous districts of British Guiana watered by the Mazaruni, the Partamonas of the Potaro river, the formidable Arecunas, who dwell in the upland valleys about Roraima, the Wayewés of the Upper Essequibo, the Tairas of French Guiana, lastly the Macusi about the headwaters of the Rio Branco, all belong to the widespread Carib family, and speak closely related dialects of the same stock language. Like the Wapisiana in the dividing range between the Essequibo and Rio Branco, the Galibi tongue has become a sort of lingua franca for all these tribes. Several Carib words, such as *cayman*, *toucan*, and *hammock*, have found currency in the European languages.

In general, the Caribs of Guiana are inferior in physique to the Arawaks, especially if the Atorais be taken as the type of this race. The Galibi have short, slender figures, while their round, soft, and beardless face gives them a feminine look. The Macusi, though more hirsute, have heavier frames and more massive figures.

Like most Indians, the Roucouyennes look taller than they are, which is due to the length and fulness of the bust contrasting with the slight development of the extremities. The long bandages in which they wrap themselves in accordance with their hygienic ideas give them the appearance of great corpulence. Their figures are very short, while the feet are broad and flat, and the eyelids slightly oblique, as with the Chinese. They have the habit of plucking out the eyebrows "the better to see," as they say, but more probably as an offering to the sun.* Some of the Galibi tribes also follow the Wapisiana fashion of piercing the lower lip with bits of bone or a peg, which they keep constantly moving with the tongue, and of causing the calves to swell by means of wide garters tightly clasped below the knee.

THE TUPI AND OTHER ABORIGINES.

The Tupi, who form the third ethnical division of the Guianas, are a branch of the great Brazilian race represented by hundreds of tribal groups between the Maroni and Plate rivers. In Guiana territory the two chief Tupi tribes are the Oyampi of the Tumuc-Humac range about the Upper Oyapok, and the Emerillons, who dwell farther west between the Approuague and the Maroni affluents. Both are skilled agriculturists, raising quantities of manioc for the gold hunters, with whom they are becoming assimilated in speech and costume.

But amongst the tribes of these inland regions several still survive whose language is unknown, and whom it is not yet possible to affiliate to any of the surrounding ethnical stocks. Such are the Oyaricoulets, who are reported to occupy the valley of the Itani, which flows through the Awa to the Maroni. According to local report—for no traveller has yet described them from personal observation—they have a white complexion, with blue eyes and light beard; hence some writers have felt inclined to regard them as whites keeping aloof from their European

* Élie Reclus, MS. Notes.

kindred. Coudreau, however, was assured by the Roucouyennes that these Oyari-coulets were "like the other Indians."

In British Guiana rumour speaks also of the fabulous Didi, a hairy race, whom all the other natives dread without ever having seen them. But in these regions, when an Indian is afraid of seeing any formidable being, or even a rock of fantastic shape, he rubs his eyes with red pepper. Then, seeing nothing, he is happy in the thought that there is nothing more to be seen.

GENERAL CHARACTERISTICS OF THE GUIANA INDIANS.

But to whatever ethnical divisions the Guiana Indians may belong, they have all very much the same usages. Were habits and customs to be taken as a criterion of racial affinity, many peoples of different speech would have to be classed together. Thus the Galibi, Oyambi, Emerillons, and Wapisianas, all practising the couvade, would be grouped in the same category. But such resemblances may be due rather to a common environment and like economic conditions than to blood relationship.

In none of the tribes has authority been firmly established on the model introduced by the European settlers. Certain persons may bear more or less distinctive titles; but for all that they are not true "chiefs" in the common acceptation of the term. Their personal qualities may ensure them great influence, but they must not interfere so far as to issue orders. Each member of the tribe enjoys full personal liberty in all his movements and actions. This freedom extends even to the children, who are never punished. "Dogs alone are beaten," says a Macusi proverb.

Nevertheless, the ordeals formerly inflicted on the young of both sexes on reaching the adult period were atrocious. Thus the mother scourged her daughter while father and brothers slept, and woe to her if her cries roused them from their slumbers. Amongst the Roucouyennes the initiatory rites consisted in subjecting both boys and girls to the sting of wasps and bite of ants. The unhappy victims swooned away in sheer agony without uttering a groan.

To their healing and divining powers the *peaimen* (*piai*, *puyai*, *pearizan*, or medicine-men) are indebted for a larger share of moral authority than that of the so-called chiefs; but even they would never presume to exercise any direct control. Perhaps the veneration in which they were formerly held should in great measure be attributed to the severe trials which they had to undergo before being considered worthy of admittance into this primitive order of priesthood. More than one of the candidates succumbed to the prolonged hardships they had to suffer during the terrible years of novitiate.

But at present the preliminary training has been greatly mitigated and curtailed. The chief instrument of the rite is the maraca, a small calabash about the size of the fist enclosing a few rattling pebbles. This maraca serves to scare the devil and, if need be, to raise him, especially when a *kenaima* or avenger has to be summoned in case of bloodshed. Inspired by the relentless spirit of the vendetta, the man who undertakes the duty of following and killing

the wrong-doer, or, failing to find him, any of his kindred, is no longer a respecter of persons; for the time being he has neither clan nor family; he disappears in the depths of the forest, and does not again show himself in public until he has throttled, poisoned, or even tortured his victim. But the kenaina plays many parts, and to his malevolence are usually accredited all diseases; hence to circumvent him trees are often cut down and strewn across his presumed track.

In some tribes, and especially amongst the Roucouyennes, the dead are still occasionally cremated, all their belongings being heaped on the pyre and consumed with the body. All travellers are unanimous in asserting the former prevalence of anthropophagy. But the chief tribes that were addicted to this horrible practice, such as the Nouragues of the Approuague valley and the Acoquas of the Tumuc-Humac mountains, have already disappeared. Amongst the descendants of these cannibal tribes are mentioned the Tairas and the Oyampi.

So recently as 1830 the Oyampi still sang the burden of the songs celebrating the old rites: "In the olden time we were men, we ate our enemies; now like women, we eat nothing but manioc." The very word *Oyampi* would appear to mean "Men-eaters." But it may be confidently stated that since the close of the eighteenth century cannibalism has completely ceased amongst all the known tribes. The Caribs burnt the heart of the vanquished foe, and mingled its ashes with their drink.

The largest share in the steady decrease of the native populations is taken by the warlike tribes, who have generally best preserved their racial purity. More than half of the groups mentioned by the old writers have already disappeared. Nevertheless the survivors are still far more numerous than is commonly supposed. Explorers ascending the rivers often overlook the groups encamped in the recesses of the forests. The indigenous population of the Guiana seaboard, exclusive of the Amazonian slopes, would appear to still number about 8,000.

THE BLACKS—THE BUSH NEGROES.

Thanks to the slave trade an African population has been introduced into the Guianas, chiefly by the Antilles route, which, jointly with the half-castes, far outnumbers the aborigines. Distributed at first in the plantations of the coastlands, and afterwards removed by their owners to the towns as domestic servants, the negroes have everywhere throughout this region supplanted the aborigines, who have retired before the progress of culture farther and farther into the backwoods.

A stop was put to the importation of black labour in the Guianas by the abolition of slavery, first proclaimed in the French territory in 1794, and later carried out effectively in British Guiana in 1838, and successively thereafter in the other colonies. Nevertheless a part of the overflowing black population of Barbadoes found its way to the Guianas, thus continuing the movement of African immigration by new elements under new conditions. Thousands of free Kroomen from Liberia also find employment in the timber-yards and as sailors on board the coasting vessels. But after procuring by strenuous efforts enough money to

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purchase several wives, these natives of Liberia usually return to their native land.

At present the Guiana negroes form two natural groups—the descendants of the slaves who, after intermingling with the free immigrants, have always remained in contact with the white settlers on the coast, and the independent blacks, who live in the interior of the country. These descendants of the Maroons, or runaway slaves, who have now become peaceful citizens, reconciled with the offspring of their former masters, are universally known as *Bush Negroes*, the *Bosch Negers* of the Dutch, and the *Nègres Boch* or *Nègres des Bois* of the French.

But, despite their name, these blacks do not roam the woods like wild game, but are, on the contrary, peaceful agriculturists, settled along the banks of the river, where they occupy permanent villages surrounded by cultivated lands. Negro republics have been founded in the British, Dutch, and French territories; but the most numerous groups have established themselves in the Surinam and Maroni river basins.

The first migrations took place in the year 1663, when the Portuguese Jews of the Surinam valley sent their slaves to the forests in order to avoid the poll-tax, hoping they would return as soon as the tax-gatherers' backs were turned. But the fugitives, having tasted freedom, remained in their camping-grounds. About fifty years later (1712) some French marauders having invaded the Surinam and Commewijne riverside plantations, the proprietors took refuge in the capital, leaving their slaves to shift for themselves. The majority joined the French in plundering the abandoned houses, and on the return of the owners took refuge in the neighbouring forests, where they began a protracted war of pillage and reprisals with the whites.

The number of predatory bands increased from year to year, and suddenly, in 1730, a formidable insurrection broke out in the Upper Surinam basin on the plantations belonging to the Government itself. The struggle lasted with varying success for nearly 20 years, when the authorities were fain to recognise the insurgents as belligerents and freemen. Then followed a treaty of peace, in which the boundaries of the independent territory were determined.

Other risings took place in 1757, when Arabi, a chief probably of Mahomedan origin, defeated the Dutch planters, and in 1761 compelled the Government to agree to terms of peace in the treaty of Auca, from which the principal black republic became known as that of the "Aucan (Jocan, Yukan) Negroes." Next year another group, that of the Maroons of the Saramacca river, also secured its political independence. Later other communities were established, such as those of the Poligudus (Poregoedoe) and of the Paramaccas on the Upper Maroni, the Koffi, Becoes, Matrocanees, or Musingas.

In 1772 Boni, the legendary hero of the Bush Negroes, led his bands nearly up to the very walls of Paramaribo. Regular war had to be declared against him, and an army of 1,200 men despatched from Europe, one of the chief officers being Stedman, well known for his excellent work on Guiana. The war lasted several

years, during which nearly the whole of the expedition perished, scarcely 20 of the men returning in good health to Europe. At last an alliance with the Aucans, who had remained loyal to their treaty engagements, enabled the Dutch to drive Boni back to the foot of the Tumuc-Humac mountains.

As a general rule the negroes of the interior succeeded in asserting their independence, while the slaves on the coastlands about Paramaribo and the forts were crushed by the disciplined troops opposed to them. The Maroons of the West Indies, even those of the large island of Jamaica, were never able to make head against regular soldiers proceeding systematically to the general occupation of the islands by erecting forts and opening strategical routes. But the Bush Negroes of Guiana had space in their favour. They were always free to retire farther and farther towards the unknown interior, and thus escape the pursuit of their owners.

Various estimates ranging from about 8,000 to some 20,000 have been made of these Bush Negroes, who till recently enjoyed absolute independence, but who are now being brought gradually under the control of the central administrations. Owing to the interminglings brought about by slavery, migrations, and wars, all memory of the original stock races has perished, and the only known fact, obvious enough in itself, is the almost pure African descent of the Maroons. Of these, the finest and most civilised are the Aucans, while the most degraded by isolation and poverty are those belonging to the Matrocane communities.

But according to Gifford Palgrave, all alike present a perfectly African type. "The men are often six feet and more in height, with well-developed limbs and pleasing open countenance; and the women in every physical respect are, to say the least, worthy of their males. Ill-modelled trunks and disproportioned limbs are, in fact, as rare among them as they are common among some lighter-complexioned races. Their colour is, in general, very dark, and gives no token of the gradual tendency to assume a fairer tint that may be observed among the descendants of negroes residing in more northerly latitudes. Their hair, too, is as curly as that of any Niam-Niam or Darfooree chief, or native of Senegal. I have heard it asserted more often than once that, by long domicilement in the South American continent, the negro type has a tendency to mould itself into one approaching that of the Indian aboriginal; and something of the kind might be looked for, if anywhere, among the Bush Negroes of the Surinam interior. But in the specimens that I saw, and they were many, I could not detect any such modification."*

Nevertheless, both Paul Lévy, who has lived with the negroes of the auriferous regions, and Carl Appun, who resided many years in British Guiana, affirm that the tendency is perceptible. The colour of the skin would appear to be less black, the hair longer and less woolly. But it is not always easy to distinguish between full-blood and half-caste types, and interminglings have taken place not only between blacks and Europeans, but also between blacks and Indians. Thus the Caribougres (Karboegers) of the Coppename river are the issue of negro

* *Dutch Guiana*, p. 170.

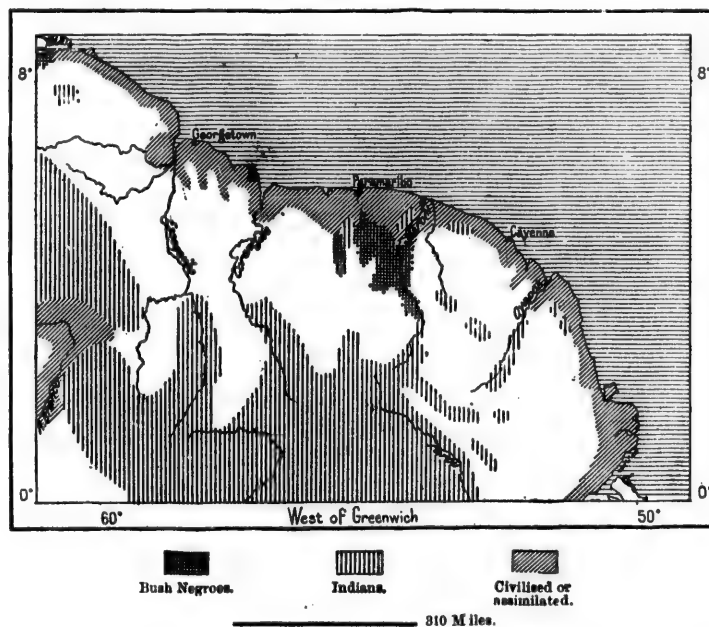
fathers and Indian mothers, and consequently any inferences drawn from their appearance would be fallacious.

Some few words of the African negro or Bantu dialects are said to have been preserved in the language of the Maroons, which has an English basis with a very large Portuguese element. Next in order of importance come the Dutch and French contributions, all uttered with the thick soft African pronunciation, and connected together by an extremely simple syntax. But this primitive jargon is gradually yielding to the cultured languages, English, Dutch, French, and Portuguese, of the European settlers.

Descendants of the black insurgents, whose war-cry everywhere was "Land and

Fig. 13.—INHABITANTS OF GUIANA.

Scale 1 : 18,000,000.



Liberty," the Bush Negroes have all remained agriculturists. They grow sufficient produce for their own consumption, and also supply the towns and plantations of the seaboard with rice. But their main resource is wood-cutting, which is exclusively in their hands. They fell the large forest trees suitable for building and cabinet work, and convey the lumber to Paramaribo by the rivers and canals. They run little risk of losing this monopoly, thanks to their sober habits, by which they are favourably distinguished from the aborigines. They have, however, suffered from the demoralisation rampant in the gold-mining districts. Indispensable as boatmen on the upper courses of the rivers, they show remarkable skill in managing their *corials* or *curiares*, and the light craft to which the English have given the

name of "wood-skins." These are frail canoes made from the bark of *copaifera pubiflora* or of *hymanea courbaril*, like the birch-bark canoes of the Huron Indians.

So early as 1739, the Moravian missionaries had already founded stations amongst the Bush populations, but they have had little success except with the Moesinga communities. From a vague reminiscence of the teachings received during the period of slavery on the plantations, the negroes have retained a sort of belief in a Supreme Being, creator of man, monkeys, and manioc, on the whole a beneficent deity, whose wife was called *Maria*, and whose son bore the name of *Jest Kisti*. But apart from this shred of Christianity, most of the Bushmen have preserved their nature worship, and, in fact, "they believe what their mothers believed." But the fervour even of this primitive cult seems to be on the wane in most of their villages, and the fetishes and *gadus* or effigies of tutelar animals have generally disappeared from the neighbourhood of the white settlements.

At present the chief object of negro worship is the ceiba or cotton-tree, that noblest forest growth of the West Indies, which rises in solitary grandeur in the vicinity of the settlements, its wide-spreading branches affording shelter to the community like some beneficent deity. Traces may often be seen of offerings, such as fowls, yams, libations of drink, scattered round its stem, the object being to propitiate the spirit dwelling in its branches, who is of a beneficent disposition, unlike his demon brother of the poison tree *Hiari*, who also finds some votaries inspired rather by fear than gratitude.

No idols properly so called are worshipped, but the negroes of the more inland districts cover themselves with *obeeahs* or amulets of shells, bones, or feathers; such charms are even hung round the necks of their dogs to improve their scent in the chase. A curious trait is the custom of bringing back and burying with all honours the hair of those who may happen to die at a distance from their homes.

These communities dwell in peace unruffled by the wranglings of rival chiefs contending for the supreme power. Enjoying an equal share of comfort, the Bush Negroes also enjoy absolutely equal rights. Nevertheless every village has its nominal headman nearly always chosen from the same family, and distinguished amongst his fellow-citizens, not by any personal authority, but by the privilege of parading on feast days in a military uniform and flourishing a gold-headed cane in public.

But the chiefs in a pre-eminent sense, those of the Aucan community, bear the distinctive title of *Gramman*, from the English "Grand Man." The Aucan chief is allowed a respectful precedence by his Saramaccan and Moesinga colleagues, and is, in fact, recognised as the overlord of all the Surinam Bush Negroes, though in rank and title rather than in power. His pedigree goes back to the first Aucan chief, Pamo, but in the female line, the matriarchal traditions having been preserved from times anterior to the period of slavery. The Gramman is even recognised by the Dutch Government, which, however, has taken the precaution to provide him with a European Resident under the title of *Posthouder*. This

"Postholder" was formerly a simple delegate from the whites, who at last became the chief magistrate and arbitrator in lawsuits between private persons and in differences between the various village communities. The Gramman of the Boni people in French Guiana is no longer much more than a civil functionary receiving a regular subsidy from the Colonial Government.

Like the aborigines, the negroes, other than the immigrants from Trinidad, Barbadoes, and Martinique, are decreasing, although the climate of the Guianas appears to be as favourable to the black race as it is unfavourable to Europeans. Miscegenation with other races may, to a small extent, explain this decrease; but even amongst those living apart, as well as amongst those intermingled with the cosmopolitan populations of the towns and coastlands, the number of deaths exceeds that of the births everywhere except amongst the Aucans. In the last century it was supposed that the Africans could never multiply in Guiana, because nearly all the infants died of convulsions during the first nine days after birth.

This excessive mortality is attributed by Palgrave to the ill-regulated affection of the mothers for their offspring, whom they literally "kill with kindness," which takes the form of overfeeding. But this cause being prevalent elsewhere as well as in Guiana, some other explanation must be sought. It would seem, in fact, that the blacks have not yet become perfectly acclimatised, as shown by their feeble resistance to such disorders as leprosy, elephantiasis, small-pox, and many others, which commit great havoc amongst them. Those dwelling in the bush are also exposed to the attacks of the *lucilia hominivora*, a horrible insect pest which deposits its eggs in the ears and nostrils with fatal results.

THE COOLIES—EUROPEAN SETTLERS.

After the emancipation most of the freedmen having abandoned the plantations either to seek work in the towns or else to cultivate their own holdings, the great landowners had to seek elsewhere for labourers. French and Dutch Guianas were too poor to import many alien hands; but British Guiana, with its wider extent of cultivable lands, and with the great labour market of British India thrown open by the Government, has engaged no less than 170,000 Asiatic coolies since the year 1845. At present this element represents fully one-third of the whole population of the English colony, the most valued being the so-called hill-coolies from the uplands south of the great bend of the Ganges. Emigrant offices have been opened in Calcutta and Madras to meet the demands of the Demerara planters, who have also engaged a few thousand Chinese coolies.

On the other hand, the Surinam planters have introduced labourers from Java, while Arabs, Annamites, and Senegal negroes have been attracted to the French colony. Even white labour has been sought, but only in such markets as Madeira and the Azores, whose inhabitants are accustomed to a tropical climate. These immigrants, collectively called "Portuguese," though a very mixed race, seem destined to become the true ethnical element of the Guianas of the future. They have already established themselves in several districts beyond the zone of plantations which it has taken the French, Dutch, and English some two hun-

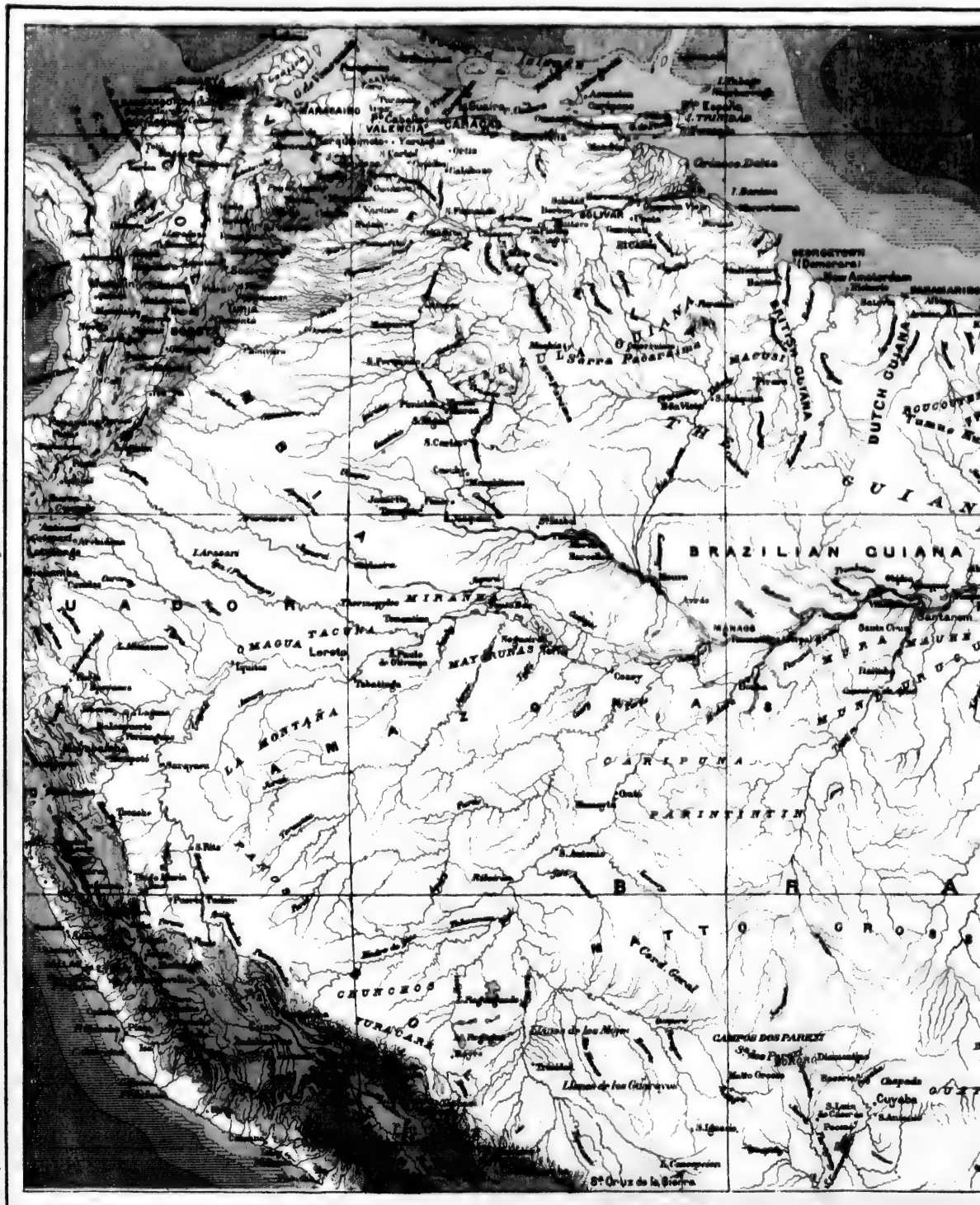
dred and fifty years of patient labour to reclaim from the swamps and woodlands. Even the whites who formerly succeeded best in Dutch Guiana were Jews for the most part of Portuguese origin. The chief group, a body of Hebrew planters expelled from Brazil, arrived in 1663, and to their influence is due the large proportion of Portuguese words that have found their way into the Creole language of the Bush Negroes.

All the costly attempts to colonise the country with whites drawn from other lands have ended in disaster. Individuals of strong constitution may no doubt become acclimatised by carefully observing all the rules of health. But to adapt whole families and communal groups to an environment so different from that of Europe is certainly a far more dangerous and difficult experiment than to settle them in Canada or the United States, especially when the emigrants are deprived of ordinary comforts and even of proper food, as has too often been the case. Although consumption is almost unknown on the coastlands, the new arrivals are rapidly decimated by the marsh fevers, which are most dangerous, especially when the hot sun begins to suck up the deadly exhalations in the swampy districts. Since the year 1855, yellow fever also has made frequent visits to this seaboard.

Hence the Europeans, although the political masters of the land and owners of the plantations, have remained practically aliens in the midst of a motley cosmopolitan population, in which the half-caste elements are steadily increasing. Except in some favourable years, the mortality is always higher than the birth rate, and meanwhile the Europeans of pure descent are being outstripped on all sides by the Portuguese islanders from the north, by the Brazilians, also of Portuguese speech, from the south, by the Spanish Venezuelans from the west; in a word, by intruders of Latin speech and culture arriving from every quarter.



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SOUTH AMERICA

1894.

Based on the text of the Universal Geography and other recent Documents .

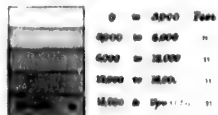
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The relative importance of towns in the various regions is indicated as far as possible by the size of the type.

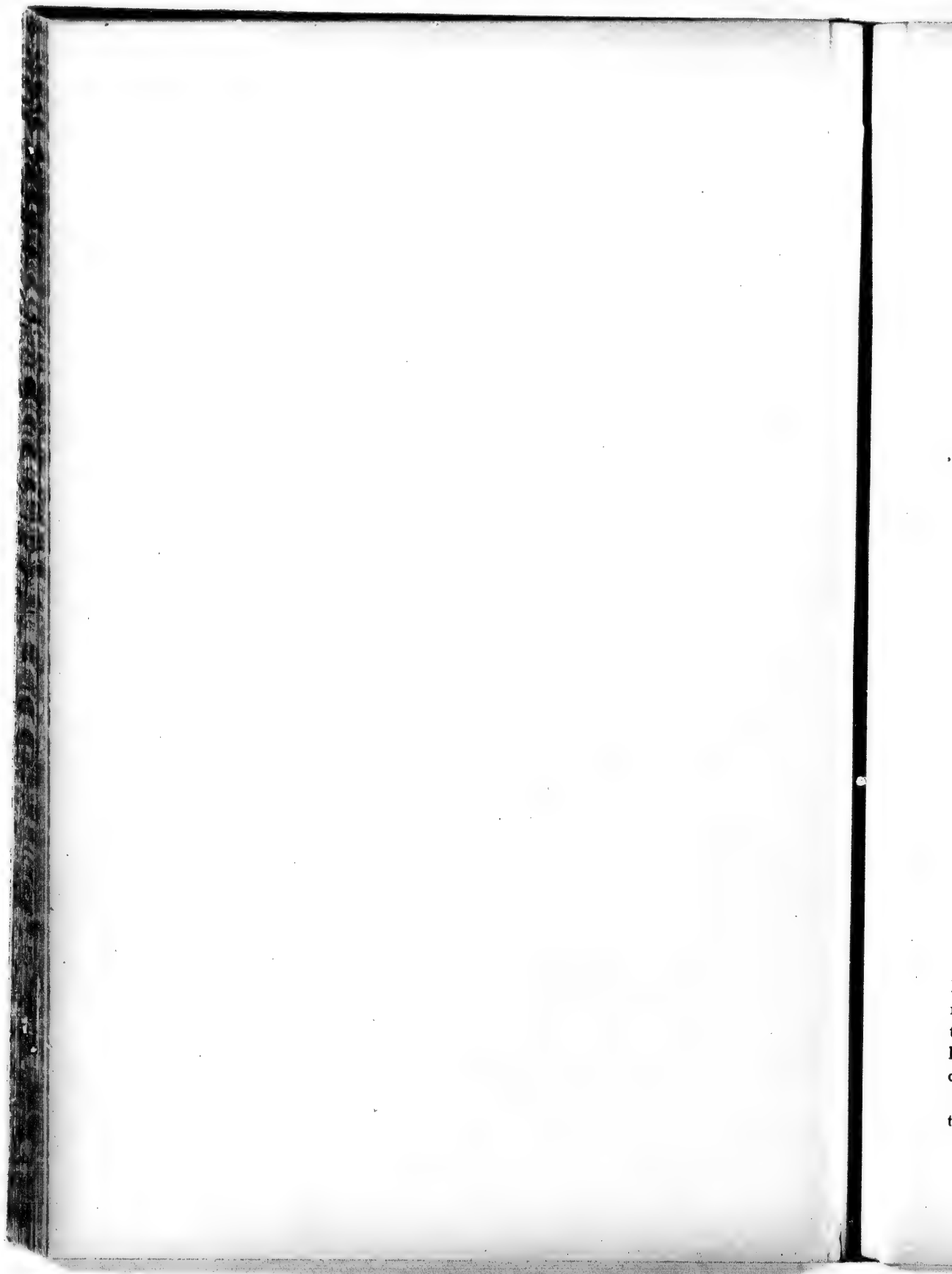
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CHAPTER II.

BRITISH GUIANA.



THIS section of the Guianas, with its still undetermined political frontiers, is by far the most important, both for population and commercial activity. It is usually taken for granted, without further inquiry, that this remarkable superiority of British Guiana as a field of enterprise is primarily due to the administrative genius of the English. But if this relative prosperity may at least in part be attributed to the non-intervention of the home government in local affairs, to the comparatively limited staff of office-holders, and to the continuity of the policy pursued towards the colony, it is none the less true that British Guiana also enjoys considerable natural as well as political advantages.

In the first place, it possesses the largest river basin, while its chief plantations are more accessible to shipping both from Europe and the West Indies. Hence these plantations had already been profitably worked by the Dutch long before the English conquest. The cultivable zone stretches along the coast, with a good seaward outfall for drainage purposes. Consequently, numerous towns and villages have been founded and estates laid out in close proximity between the Atlantic and the stagnant waters of the interior. But in Dutch Guiana and in the greater part of the French colony the marshy zone lies on the coast, masked only by a mangrove screen from the ocean.

It was easy to begin agricultural operations on the open coastlands of the British territory, and, thanks to the proximity of the West Indies, the first planters, for the most part Scotchmen, were able without difficulty to procure all the labour they needed. Since 1802, when Great Britain occupied this northern part of Guiana, which was officially ceded to her in 1814, the rulers of the land have largely profited by the neighbourhood of the West Indian colonies to favour the immigration of the negroes of the overpeopled island of Barbadoes, as well as of the large island of Trinidad. Later, when the emancipation deprived the great landowners of the slaves who worked their estates, the Indian Government threw open its coolie market for the benefit of the wealthy sugar-growers of Demerara.

All these circumstances secured for British Guiana a decided advantage over the conterminous colonies, and as a natural result this very advantage brought

about a better commercial status, a more rapid development of its industrial resources, more numerous and more active relations with the outer world. All actual progress acts as a stimulant of further prosperity. If British Guiana is no more a colony in the strict sense of the word than are the other two territories under European rule, it has at least become a sphere of spontaneous colonisation for settlers from the West Indies and the Azores. In ordinary language, the English speak of their possessions on the South American mainland as in fact forming part of the West Indies.

THE NORTH-WEST DISTRICT.

Till recently the zone of large agricultural domains was limited in British Guiana to that section of the seaboard which is comprised between the Pomerun and Berbice rivers. The north-western region, the possession of which is contested by Venezuela, remained uninhabited. During the early days of colonisation a few Dutch settlers had established themselves on the banks of the Pomerun, the first arrivals dating from the year 1580. But they had never advanced westwards in the direction of the Orinoco. Their plantations on the Pomerun itself were even abandoned one after the other, and about the middle of the nineteenth century the only inhabitants of this district were some Indians and negro half-breeds encamped in the forest glades. The latter are descendants of runaway slaves who had taken refuge here in 1738, and whom their owners feared to pursue; but the Maroons on their part did not dare to remain in the vicinity of the whites, and so joined the Indian tribes.

Regular colonisation in this district was first undertaken by some Portuguese speculators about the year 1870, and since then agricultural progress has been continuous and rapid. The chief difficulty was the interruption of the communications during the dry season. The *itabbo* or ditch connecting the Moruka and Waini rivers is completely dry for six months in the year, and even during this period the alluvial lands are not firm enough to afford a footing to wayfarers in the woodlands between the two basins.

At present the steamers plying between Georgetown and the Orinoco delta have brought the whole of the "north-western district" into easy relations with the rest of the colony. The new domain thus opened up has been occupied at three different points by traders and others engaged especially in the lumber business. One, lying nearest to the plantations on the banks of the Pomerun, stands at the junction of the waters formed by the Baramanni lagoon with the Waini river; another at the confluence of the Morawhanna, which connects the Barima with the Waini; the third at the mouth of the Barima in the Orinoco estuary. The natural and administrative centre of the whole district is the *Morawhanna* station, where the British Government has erected a group of public buildings, including a courthouse, police barracks, and hospital.

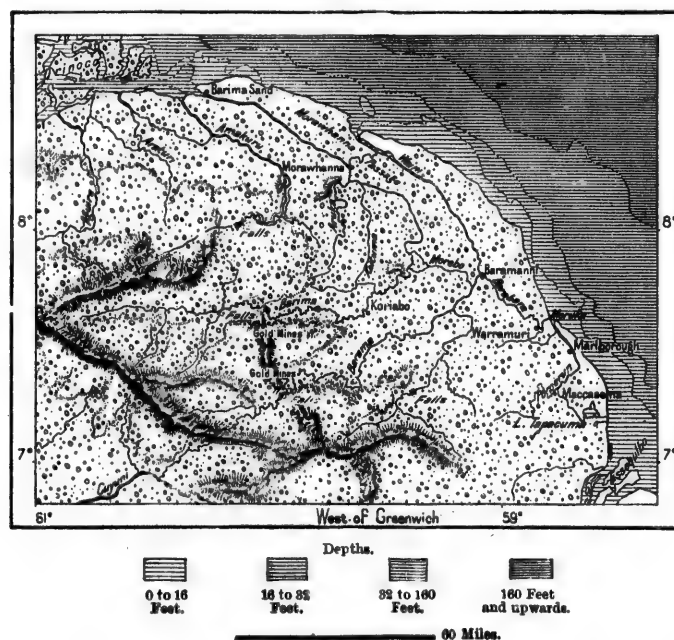
This may be taken as a proof of the determination of the Foreign Office absolutely to ignore the pretensions of Venezuela to the north-western district, which has a superficial area of 9,400 square miles. In colonial times the nearest

Spanish stations were those on the banks of the Orinoco beyond the frontiers proposed by Great Britain, and since then no part of the territory has ever been occupied by the Venezuelans. The negotiations that had been opened in 1894 with a view to the settlement of these frontier questions fell through because the Venezuelan Government insisted on including their groundless claims to the north-western district, claims that the British Government "considered to be so unfounded in fact, and so unfair to the colony of British Guiana, as not to be proper subject for arbitration" (Lord Rosebery).

The lower alluvial parts of the district comprise some of the richest soil in

Fig. 14.—NORTH-WESTERN DISTRICT, BRITISH GUIANA.

Scale 1 : 3,000,000.



the world. Some of the tracts that have recently been drained "now yield crops of tropical produce in simply amazing abundance. As an illustration of this I may mention that the garden which hardly two and a-half years ago I cleared and drained for myself now already has in it avenues of trees (*casuarina*) over 40 feet high which I then planted. On the other hand, the higher part of the new district is being fast overrun by very successful gold-diggers."*

THE ESSEQUIBO BASIN—QUATATA.

Despite its vast extent and the great development of its ramifying waters, the Essequibo river basin has hitherto received but a very small portion of the Guiana

* In Thurn, *Proceedings of the Royal Geographical Society*, October, 1892.

populations, nor has any centre of European enterprise been yet established within its limits. The region about its headwaters is occupied by the Taruma Indians, who are rarely visited by travellers, and whose relations with the colony are conducted through the agency of a few traders thinly scattered over a wide space.

Groups of hamlets follow at great distances along the course of the rivers, especially about the portages, where the cataracts have to be turned by the boatmen. The river traffic carried on by their means is almost entirely limited to the section of the Essequibo below the confluence of the Rupununi, although this affluent follows the natural route between the Atlantic and the Amazon basin through the Pirara depression. But everywhere the riverside stations are wide apart, and till recently they were exclusively inhabited by Indians and half-breeds, with a few black or Portuguese dealers from the distant coast towns. Nevertheless, there can be no doubt that sooner or later the broad highway leading from the Atlantic to Amazonia will acquire great commercial importance.

Meanwhile, the chief group of huts near the Pirara depression is the obscure village of *Quatata*, trysting-ground of the Wapisiana, Macusi, and Wayewé Indians, who here carry on a barter trade in hammocks, sarbacanes, and other objects of native industry, taking in exchange the cutlery, beads, dogs, and manioc rasps supplied by the European dealers. The natives have been visited both by Protestant missionaries from Demerara and by Catholic Fathers from Manaos, and near Quatata are seen the remains of the little *Fort New Guinea*, erected by the English to uphold the claims of Great Britain to this important strategical position. The district is yearly visited by half-caste Brazilian immigrants engaged in stock-breeding.

BARTICA.—ZEELANDIA.

At the confluence of the navigable Mazaruni and Cuyuni affluents above the estuary stands the little town of *Bartica Grove*, or simply *Bartica*, at one time a flourishing mission station, till lately reduced to a few wooden huts embowered in the overhanging riverside vegetation, a recently restored church, some small residences, and a few timber-sheds. The picturesque village, with its avenues of tall mango-trees and tangle of flowery shrubs overtopped by groups of graceful palms, was till recently occupied chiefly by the so-called "river-men," idle negroes and half-breeds, who make a precarious living on the Government timber-grants, or as boat-hands to help travellers in surmounting the numerous cataracts of the Essequibo affluents.

Since 1887 the prosperity of Bartica has revived, thanks mainly to the development of the gold-mining industry in the western districts. The place is now rapidly increasing, and tends to become the chief trading centre of the colony. Chinese and Portuguese traders have already opened numerous stores for the supply of the mining populations, and the future of Bartica seems to be assured by its advantageous position at the converging point of a network of navigable waters leading in one direction up the Essequibo to the Amazon and Brazil, in another by the Cuyuni towards the Orinoco and Venezuela.

A few miles to the west an eminence rising above the left bank of the Mazaruni-Cuyuni, a short distance above the confluence, is crowned by the extensive buildings of the penal settlement, established in 1843, and containing about 300 convicts. To prevent the prestige of the ruling race from being lowered, no English criminals are confined in this establishment, which is surrounded by a magnificent park, planted with fine trees of rare species. The mansion of the governor, the houses of the officials and turnkeys are all shaded in an exuberant vegetation of tropical growth.

The convicts are mostly employed in working the neighbouring quarries, which supply Georgetown with the granite required for its quays and buildings. Some of the well-conducted enjoy a moderate share of freedom, being allowed to seek employment in the district as carpenters, gardeners, or woodmen. A steamer plies regularly between the settlement and Georgetown, Bartica being the chief station on the route.

Below the Mazaruni confluence the Essequibo develops its broad estuary, at first in an open expanse some miles wide, and lower down in numerous channels winding between an archipelago of islands, nearly all inhabited. One of these, three miles from the sea, contains the still-imposing ruins of Fort Zeelandia, which was erected by the Dutch in 1743 as the commercial and administrative centre of their colony. Each island is rounded off in a superb dome of rich vegetation, while the view is everywhere bound by a circle of arborescent growths. The larger members of the archipelago are occupied by plantations surrounded by large timber, and cultivated grounds stretch along the estuary north-westwards in the direction of the Pomerun, north-eastwards towards Georgetown, at the mouth of the Demerara.

GEORGETOWN.—NEW AMSTERDAM.

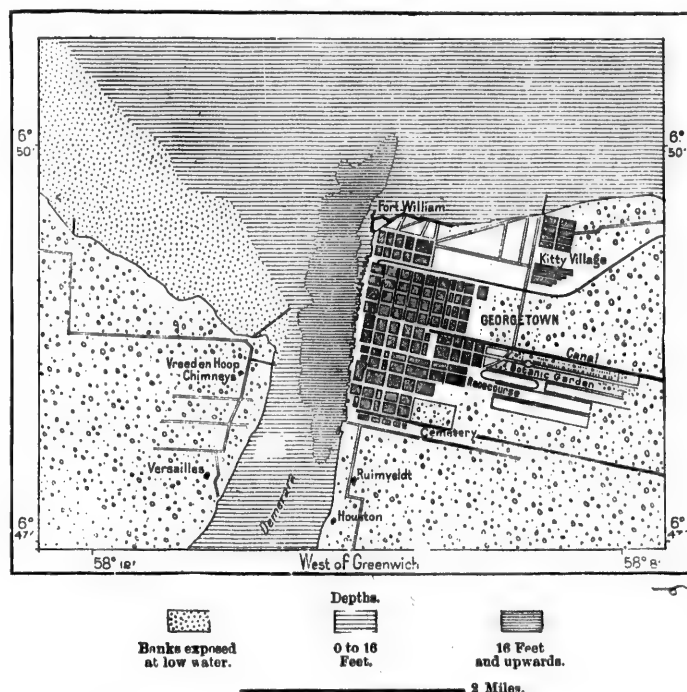
The old Dutch town of *Stabroek*, which in 1774 supplanted Zeelandia as the residence of the governor, has acquired considerable importance since it has become the capital of British Guiana under the name of Georgetown. It is already the largest centre of population on the stretch of seaboard between the Orinoco and Amazons estuaries, and here are concentrated twice as many inhabitants as are found in the whole of French Guiana: Yet, seen from the sea, Georgetown almost escapes observation, little being visible except a dense mass of leafy vegetation overtopped by clumps of cocoanut palms and oreodoxas. But a nearer view reveals the shipping which crowds the broad Demerara estuary, with a background of elegant white houses skirting the right bank of the river.

Georgetown, which is inhabited in large majority by blacks and people of colour, extends considerably over a mile along the estuary between *Fort William* at the entrance and the group of villas dotted over the plains. Even in the vicinity of the busiest thoroughfares and of the quays where are stored nearly all the products of the Guianas, the houses with their verandahs of flowering creepers are surrounded by shady gardens, and each dwelling has its cistern for watering the trees and flower-beds.

Numerous artesian wells, sunk at distances of 300 or 400 yards, yield a supply of water slightly charged with minerals. Till recently the suburb of *Hopetown* was almost exclusively inhabited by Chinese, and a large agricultural population is also distributed over the rich and carefully cultivated plantations which extend for great distances round about the capital, both on the seaboard and along the river banks. The railway running eastwards to *Mahaica*, on the river of like name, has developed a large local traffic in goods and passengers. This line, 23 miles long, dates from the year 1850, being the first opened in South America; it is to be continued towards *Berbice*, but is meantime the only railway in British

Fig. 15.—GEORGETOWN.

Scale 1 : 87,000.



Guiana. At *Mahaica* has been founded a lazaretto, with accommodation for about 200 victims of leprosy drawn from every part of the colony.

New Amsterdam, called also *Berbice*, from the river on the right bank of which it stands, occupies in the eastern district a position analogous to that of *Georgetown* farther west. As indicated by its name, this place is also of Dutch origin, as might almost be inferred from the numerous canals flowing between its different quarters. Although the first buildings date from the year 1796, subsequent changes have failed to efface the primitive aspect of the town, with its silent canals, its shady squares, and quaint houses embowered in verdure.

MATERIAL CONDITION OF BRITISH GUIANA.

As in other regions exploited by slave labour, field operations, performed by men like machines, controlled by overseers armed with the lash or the stick, were incompatible with the cultivation of any great variety of crops in British Guiana. Simple processes carried out in a mechanical way were alone possible; hence the products of the sugar-cane—rum, "foots," molasses—besides cotton and coffee, were the only articles of export during the plantation days. Even still, despite the abolition of slavery, the crude old agricultural systems linger on, and land tenure has undergone no change, large domains still everywhere prevailing. Only the gangs of black slaves are now replaced by contract labour, though the Hindoo coolies have to conform to the same old rigid methods of routine work. A single estate on the left bank of the Demerara comprises as many as 5,600 acres, and yields 5,500 tons of sugar, employing altogether 3,730 coolies and freedmen.

The administration, however, has at last discovered that it would be unwise to dispose of the remaining unallotted lands in great domains. With a view to attracting settlers, efforts are being made to create a numerous class of small freeholders by limiting to 50 acres the lots granted to new arrivals.

THE SUGAR INDUSTRY.

As in the slave days, sugar continues to be the staple crop. About half of all the cultivated land is under cane, and this single item represents on an average over nine-tenths of all the colonial exports. Thanks to the fertility of the soil, improved processes of production, and the excellent quality of the sugar, the Demerara planters have hitherto been able to hold their own against the fierce competition of the European beet-sugar growers. But to maintain their ground they shrink from no necessary outlay. While utilising the upheaved strip of coastlands, they have encroached on the sea itself, by the construction of an exceedingly costly system of dykes, which at the same time serve as roads.

The land has been cut up by a network of canals and trenches, by which the surface is drained, while facilities are afforded for the transport of the cane. The soil is renovated by a liberal employment of chemical manures, and the mills have been provided with the most improved machinery and general plant for crystallising the sap to the best advantage. The cane, containing on an average 17 per cent. of sugar, is thus made to yield as much as 16 per cent., whereas by the old processes of crushing scarcely one-half could be extracted. The best "Demerara" commands on the English markets prices far higher than the product of all other sugar-canes. It is also exported to Nova Scotia, Newfoundland, and other British colonies, and, despite the heavy protective tariffs, it competes successfully with the sugars of Louisiana and of Cuba in the United States markets. The Demerara rum, which is greatly inferior to that of Jamaica, is exported chiefly to Great Britain; while the Georgetown molasses are highly appreciated in the French Antilles.

The Berbice coffee plantations, which formerly yielded a choice variety of the berry, have now been almost everywhere replaced by cane; in fact, the shrub is

scarcely anywhere met except in gardens and in the small negro holdings. Next to sugar the chief product of British Guiana at present is lumber, which is cut by the Partamona and Calina tribes on the banks of the Essequibo above Bartica and in other fluvial valleys south of the plantations. These Indians are closely related to the Galibi who dwell on the banks of the Maroni about the Franco-Dutch frontiers.

In late years the trade in fruits, cocoanuts, and bananas has acquired some importance, and, despite the distance, might compete with the fruit trade that has sprung up between Central America and the United States. The Guiana fruits, especially the bananas, have a delicate flavour fully equal to those of the West Indies, Costa Rica, and Guatemala.

TRADE—ADMINISTRATION.

Altogether British Guiana has a mean annual export trade of about £8,000,000 in sugar and other products of cane, timber, cabinet woods, and fruits, to which in late years have been added gold dust and small diamonds collected on the banks of the Barima and Cuyuni rivers and in the alluvia of the coast streams in the north-western district. "In 1884 the gold exported was only 250 ounces from the whole colony, and this had increased in steady and natural ratio in 1891 to 101,297 ounces. From the Morawhanna river, from which the first gold—129 ounces—was obtained only in November, 1889, 2,836 ounces were obtained in March, 1892. It should be added that though the metal as yet obtained has been got by means of such primitive instruments as the battel, the tom, and the sluice from the alluvial mud, there are already signs that the more serious enterprise of quartz-crushing will soon be entered on." *

British Guiana imports provisions, machinery of all kinds, textile fabrics, and other manufactured wares chiefly from England, and to some extent from the United States. Georgetown is now connected by regular lines of steamers with Great Britain, the West Indies, and Canada.

Till the year 1831 Demerara and Berbice constituted two distinct colonial governments, as they had under the Dutch rule. Most of the laws and local regulations had been maintained, and numerous traces still survive of this system. The political power is almost exclusively in the hands of the governor as representative of the Queen. He is assisted in his administration by a "Court of Policy" composed of the five chief colonial officers, and of five members chosen by the Court and the two presented by the notables, who form electoral bodies numbering altogether 2,046 in 1893.

To the Governor and Court of Policy are also entrusted the legislative and executive functions. But in determining the rate of *taxes* the Governor has to consult six financial representatives, who form, with the other Government officials, a "Combined Court." The colony is still administered under the Dutch civil law, modified by various decrees and ordinances; but the criminal law has been conformed to that of England, though the jury system has not yet been adopted.

* Im Thurn, *Proc. R. Geo. Soc.*, October, 1892.

The so-called "Rhenish" scale of weights and measures still prevails on the banks of the Demerara, although abolished in Holland itself.

The police comprises a few hundred men, while the military garrison numbers about 300 soldiers, drawn from the West Indian black regiments. The Church of England, which is the national church, has a hierarchy of one bishop, with a number of rectors and curates supported by the British Government, which also subsidises the Presbyterian and Catholic Churches. In 1891 about 28,000 children, or one-ninth of the whole population, were receiving regular instruction in the colonial schools. The annual budget usually balances itself, while the public debt amounted in 1890 to £200,000.

The colony is divided into the four administrative districts or counties of the North-West, Essequibo, Demerara, and Berbice.





CHAPTER III.

DUTCH GUIANA.



THE Dutch, who were the first settlers in British Guiana, laid the foundations of the prosperity of that colony to the benefit of their English rivals. What they have preserved of their old possessions is of far less value than what they have lost. Surinam, as they call their present colony of Guiana, has scarcely one-sixth of the population grouped round Demerara, in the British possessions, while its trade hardly amounts to one-fifth of the commercial transactions carried on by the neighbouring colony.

The economic crisis following the abolition of slavery in 1863 involved numerous plantations in utter ruin, and vast stretches of cultivated land reverted to the solitude of the savannas and woodlands. The population even decreased by emigration, and several years of decadence elapsed before the first symptoms of a slow revival became manifest. At present the population is on the increase, though this is due to the arrival of a few Indian coolies. The planters are gradually resuming possession of the land, but are for the most part devoting their attention to economic plants different from those cultivated by their predecessors.

As in British Guiana, the inhabited and cultivated zone forms but a small part of the whole territory. It comprises the coastlands between the outer belt of bush and mangrove swamps and the inland savannas. But even in this cultivated zone there are numerous gaps occupied by scrubby and marshy tracts.

NICKERIE—GRONINGEN.

Nickerie, the westernmost district, lying east of the Corentyne and its estuary, is but thinly settled, and the population is still very slight. At the beginning of the nineteenth century some planters and traders established a colony at the headland close to the confluence of the Corentyne with the River Nickerie on the right bank of the estuary. The site seemed favourable, and the settlement increased rapidly. But in less than two generations the very ground on which the quays and buildings had been erected was swept away by the Atlantic waves

continually encroaching on the land. The inhabitants, disheartened and compelled to retreat constantly towards the interior, at last dispersed, and nothing remained except a little group of cottages at the entrance of the estuary.

According to Palgrave, the rapid advance of the sea at this point is due to a subsidence of the land, and not, as the residents supposed, to a change in the direction of the winds and currents, giving more force to the breakers. This observer speaks of "a broad, triangular space of shallow water, lashed into seething waves by wind and current, where, a few feet under the surface, lies what was once the busy area of populous streets. Meanwhile the breakers, not content with the mischief already done, continue ceaselessly tearing away the adjoining land bit by bit. Right in front a large house, left an empty shell, without doors or window-frames, by its fugitive inhabitants, is on the point of sinking and disappearing among the waters that, unopposed, wash to and fro through the ground floor. Close by the victorious sea has invaded the gardens of the neighbouring dwellings, and will evidently soon take possession of the buildings themselves. Farther on a few isolated fragments of what was once a carefully constructed sea-dam rise like black specks among the yeasty waters, and the new earth-wall built to protect what yet remains of Nickerie has a desponding, makeshift look, as if aware that it will not have long to wait for its turn of demolition."*

Groningen, another colony of which its promoters had great expectations, has proved even a greater failure than Nickerie. It was founded in 1843 near the Saramacca estuary, and peopled with Frisians carefully chosen for the purpose of introducing "white labour" into these equatorial regions. But the enterprise met the fate that invariably overtakes all such experiments. Of the 384 settlers about one half were dead within six months, and most of the survivors had to remove to the neighbouring plantations. Several have prospered as artisans and gardeners in Paramaribo, but Groningen itself has all but disappeared. It stood about midway between Paramaribo and *Batavia*, which lies a few miles to the south-west on the right bank of the Coppename estuary.

Here is a lazaretto, where the patients are maintained by their friends and families. But the village lies too near the settled districts, and another leper-house is to be established on the right bank of the Upper Surinam in the uninhabited district of Grand Châtillon. Nowhere are the ravages of this loathsome malady more destructive than in Dutch Guiana, especially among the blacks and people of colour. In 1893 nearly a thousand were said to be tainted.

PARAMARIBO.

Unlike Georgetown and New Amsterdam, *Paramaribo*, capital of Dutch Guiana, does not lie on the sea coast. In this region the form and character of the seaboard has required the towns and settlements of the plantations to be established in the relatively dry zone, which is traversed by the coast streams flowing parallel with the strip of swampy mangrove-covered foreshore. Para-

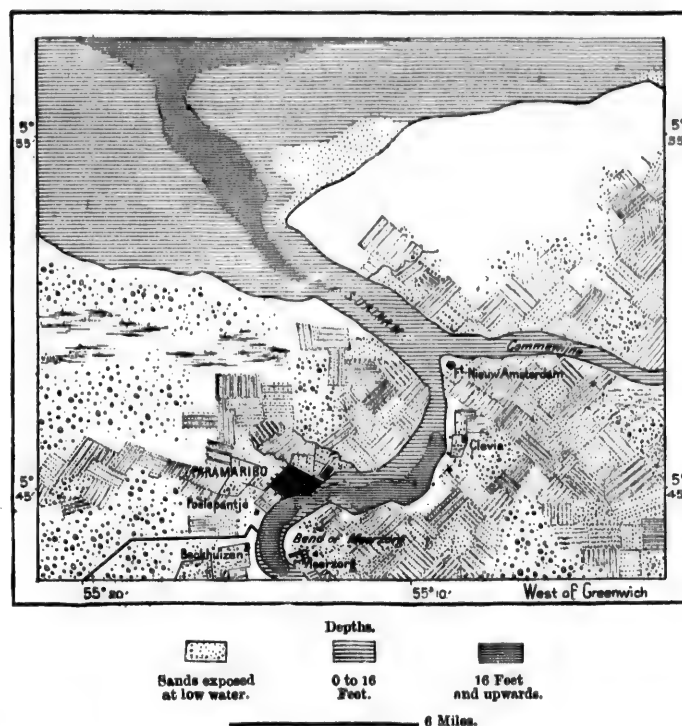
* *Dutch Guiana*, p. 17.

maribo is a French foundation dating from the year 1640, when some refugees from Cayenne built a little fortalice on the spot where now stands *Fort Beelandia*, on the left bank of the Surinam just above its estuary. Ten years later Lord Willoughby of Parham raised the place to the dignity of a capital, and when it soon after passed into the hands of the Dutch, it became the administrative centre of their Surinam possessions.

Paramaribo, which is an Indian name and not a corruption of Parham, stands on a terrace of shingle, coral, and shells at the point where the river describes a

Fig. 16.—PARAMARIBO AND SURINAM ESTUARY.

Scale 1 : 830,000.



curve round to the east before its junction with the Commewijne at the head of the estuary. It has the aspect of a tropical Amsterdam, and, despite the difference of materials, its wooden houses painted grey recall the more substantial brick structures of the Dutch city. Some Government buildings, such as the Government palace, the synagogue, and a few churches impart an air of importance to this somewhat old-fashioned town. Being well kept it is by no means an unhealthy place, although the atmosphere, unrefreshed by the sea breezes, somewhat resembles that of a hothouse in Kew Gardens.

Paramaribo is soon to be connected by rail with the fertile riverside districts in the Saramacca valley. The approaches from the sea are commanded by *Fort Nieuw Amsterdam*, which occupies a strategical position of vital importance at the Commewijne confluence in full view of the estuary.

EASTERN SETTLEMENTS.

East of Paramaribo the banks of the Commewijne and Cottica rivers were lined with an uninterrupted succession of gardens and plantations, which are now partly abandoned, while most of them have changed hands. Black descendants of the old slaves have become the owners of many a domain which at one time depended on some great Dutch landed estate. The village of *Sommelsdyk*, commanded by a pentagonal fort at the junction of the two streams, recalls the name of the famous Dutch governor, who was himself owner of one-third of all the colonial plantations.

Some 50 miles above Paramaribo on the Surinam river, are seen the ruins of a synagogue and of a group of cottages at a place called *Joeden Sarane*, "Savanna of the Jews," which preserves the memory of the Portuguese and Leghorn Jews, who, after their expulsion from Pernambuco, took refuge in Guiana and established themselves on the banks of the Surinam in 1641. The white population is still largely composed of Israelites, who control the money market of Paramaribo, and supply the colony with most of its professional men—doctors, lawyers, and judges. During the eighteenth century these Semites had their own administration of justice, at least for all cases heard in the lower courts. During their religious feasts also they enjoyed the privilege of immunity from arrest or legal prosecution of any kind.

The left bank of the Maroni on the French frontier is very thinly peopled. Here the scattered groups of cabins nearly all belong either to the Galibi Indians or to the descendants of the Maroons, now universally known as Bush Negroes. The western streams are inhabited by a few communities of *Bovianders*, that is, half-breeds sprung from Dutch fathers and Indian mothers.

NATURAL RESOURCES.

During the slave period, sugar was the chief crop in Surinam, as in British Guiana. But the planters, unable to resist the crisis following on emancipation, abandoned most of their large estates; hence the colony even now possesses only a small number of sugar mills belonging to wealthy capitalists, who have provided them with plant and machinery as complete as those of the Georgetown factories. A single proprietor employs as many as 1,580 hands, negroes, Hindus, Javanese, and Chinese.

The cultivation of the coffee shrub, which had formerly acquired great importance, producing about 6,000 tons for the annual export trade, was neglected to such an extent that the colony had to import the coffee required for its own consumption. This industry, however, has been revived with fair prospects of permanent success since the year 1883, when some speculators introduced the

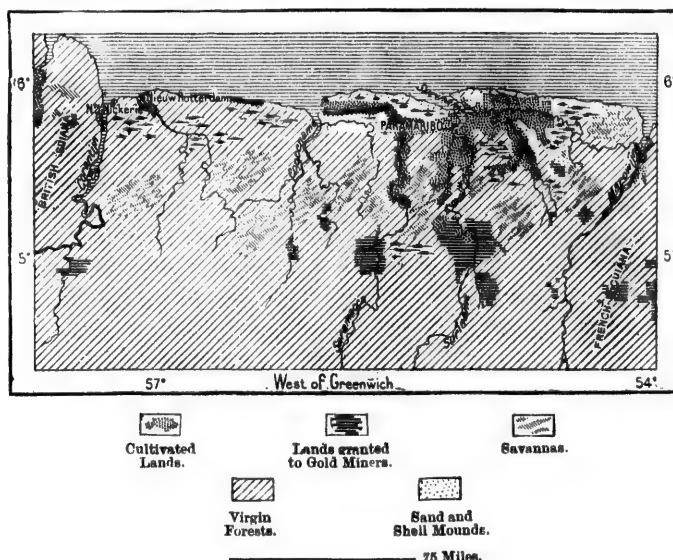
Liberian plant, which thrives admirably in the Surinam territory, better even than in Java itself.

In the north-western districts some attention has been paid to the *balata*, a plant which has been called the gutta-percha of Guiana. Cotton is no longer grown, being entirely supplanted by cacao, the staple product, the cultivation of which requires little care. Although the cacao tree produces nothing for eight or ten years, after that it yields a certain and regular harvest.

As a rule, the large plantations, whose products feed the export trade, enrich the country less than do the small holdings, in which the negroes and peasantry of various races raise provisions, vegetables, fruits, and especially bananas. An experiment in communism has been carried out on the *Overzicht* estate, which is

Fig. 17.—CULTIVATED ZONE, DUTCH GUIANA.

Scale 1 : 4,000,000.



jointly held by a colony of 300 negroes, engaged in husbandry and the lumber business.

In Dutch, as in British Guiana, the gold industry has lately acquired some importance. Diggings had already been carried on for some 20 years in the French territory, when the Dutch Government had the affluents of the Maroni explored, and here the precious metal was discovered by the prospector, Alma, in 1874. Since that time further discoveries have been made in the upper valleys of all the rivers, and especially on the banks of the Awa, the tributary of the Maroni recently awarded to Holland.

The yearly yield of gold has steadily increased without having yet reached the sum of £160,000. At first the auriferous sands alone were washed; but

recently the miners have ascended the valleys, and have begun to attack the primitive rocks in which the mineral is embedded. Thus the mining industry has rapidly become one of the important branches of the colonial industry, which had hitherto been limited to a small number of products. With a view to the development of the gold-mines, a road 50 miles long has been opened between the Surinam and Maroni rivers.

ADMINISTRATION.

Despite certain empty parliamentary forms, the colonial government enjoys absolute authority. The governor, named by the Crown, is also president of the "House of Assembly," comprising 13 members, of whom he nominates four. The nine others, elected for six years, owe their nomination to notables enjoying an income of at least 40 florins.

The governor proposes, and, if he chooses, disposes. Should his advice be rejected, he puts in writing the reasons of his dissent from the delegates, whereupon the majority has to consider the matter settled.

Instruction is obligatory for all children between the ages of seven and twelve, and in 1887 nearly 5,400 pupils were attending the 48 public schools. The annual budget amounts to about £160,000.

Dutch Guiana is divided for administrative purposes into 16 districts with variable circumscriptions. But all decentralised or provincial administration can be no more than nominal in a country whose capital alone contains more than half of the entire population, excluding the Bush Negroes, who are not comprised in the census returns.

The German Government is said to entertain the idea of purchasing Dutch Guiana with the view of converting it into a penal settlement like that of French Guiana.





CHAPTER IV.

FRENCH GUIANA.

I.

FRENCH GUIANA PROPER.



ERE French Guiana increased by the addition of the contested region extending from its recognised frontiers southwards to the Araguari estuary, it would equal the British territory in superficial area; but in respect of population, trade, industry, political and social life, no comparison is possible between the two colonies. Of all the French possessions beyond the seas not one has prospered less than Guiana. Its story cannot be told without a feeling of humiliation, and the example of this territory is usually chosen to show the incapacity of the French as a colonising people, as if the country had ever been a colony in the strict sense of the word.

No really spontaneous stream of immigration has ever been directed from France to Guiana ever since the sixteenth and seventeenth centuries, when some French freebooters, roving the seas, established a few ports of refuge or refitting stations at favourable points along the seaboard. All who, during the last 250 years, have landed on these shores between the Maroni and Oyapok estuaries, have come either as colonial officials and soldiers, or else in gangs of slaves and hired labourers, or even in convoys of criminals and convicts often of the worst type.

ESSAYS AT COLONISATION.

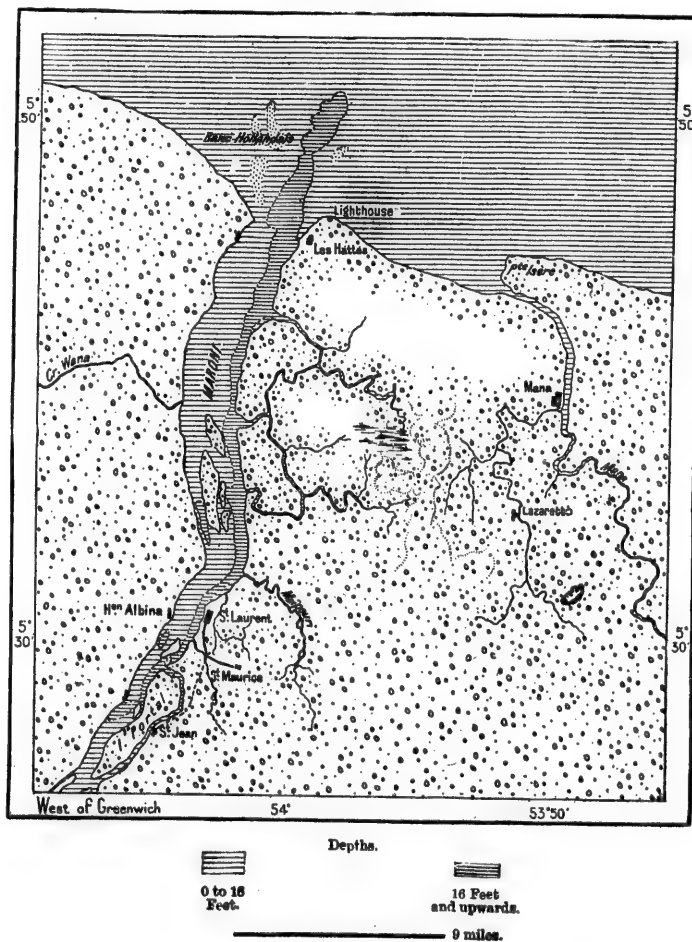
The country has never been quickened by the spirit of free colonisation. The very sites of the settlements were often selected beforehand by administrators who had never visited the colony. Impracticable decrees issued from Paris were carried out in a haphazard way; no preparations were made on the spot for the reception of the new arrivals, who consequently perished in thousands, camping without food or shelter on the banks of swampy creeks. Even those who had been more favoured by fortune, and who had obtained some cover and supplies,

succumbed at last to their hopeless plight "Feeling themselves forsaken by the whole world, they died through lack of will to live." *

All essays at compulsory colonisation having failed, it seemed natural to make choice of Guiana as a proper field of transportation for political enemies and as a convenient settlement for offenders against the common law. More

Fig. 18.—PENAL SETTLEMENTS ON THE MARONI.

Scale 1 : 450,000.



than once notoriously unhealthy districts were assigned to the exiles; tribunals which shirked the responsibility of pronouncing sentence of death were thus none the less able to call in its aid, and "the dry guillotine" became the popular name of Cayenne.

* Jules Itier, *Notes statistiques sur la Guyane française*.

Such a by-word easily enough explains the repugnance felt by all freemen for the region, which nevertheless is not cursed with the deadly climate attributed to French Guiana by the popular fancy since so many wretched victims of sentences of transportation began to be cast upon its shores.

The very failure of the frequent attempts to colonise the country had the natural consequence of causing much indecision in the plans of the central government, as well as in the activity of the local administrators. Few officials enter on their functions in Cayenne without forthwith yearning to return to their native land. Being merely "birds of passage," they can take but slight interest in a region which they hope soon to quit. But without attaching themselves to the land, they may perhaps be tempted to distinguish their administration by some ambitious scheme at variance with those of their predecessors in office, and calculated to enhance their reputation in high places.

Thus the affairs of the colony are managed in a shiftless way without a continuous policy, as needs must be in a territory which has seen thirty-four governors replace each other since the middle of the century. Hence whatever real progress is made in French Guiana, either in an increase of population or in the development of its natural resources, must be attributed, not to the administration, but to the slow ferment working spontaneously in the mass of the aboriginal elements increased by a few immigrants from Martinique, some Bush Negroes from Surinam, Portuguese and Brazilians from the conterminous regions. But on the other hand, the introduction of Hindu coolies has been made without system or humanity. Of 8,372 engaged in the prime of life, 4,522, more than half, perished within 22 years (1856-78), and of the whole number only 675 were restored to their native homes.

CONVICT STATIONS—MANA.

The basin of the copious River Maroni, which separates French from Dutch Guiana, is inhabited in its upper and middle course only by a few scattered groups of Indians, negroes, and gold-hunters. The first white settlements are seen some 38 miles above the estuary, and even these are nearly all occupied by convicts. Free colonisation in this district is represented only by a few plantations which were granted to some Algerian Arabs after their discharge from detention.

Saint-Jean, which lies farthest up the river, has the advantage of railway communication with the capital of the penal colony; but the surrounding district is marshy and unhealthy. *Saint-Laurent*, a little lower down, also on the right bank of the Maroni, is better situated, and here reside the directors of the penal station. The cabins of the Negro, Arab, and Annamite convicts occupy the sunny glades of a densely-wooded park not far from the cemetery.

Opposite Saint-Laurent stands the village of *Albina*, the only settlement founded by the Dutch on the left bank of the Maroni. In *Portal Island*, a little higher up, is situated the most important plantation in French Guiana, occupied mainly with the production of roucou.

The Mana river, which follows the Maroni in the direction of the east, has its little commune of *Mana*, named from the river, but the other coast streams, such as the Organebo, the Iracubo, and the Counamano, traverse almost uninhabited districts. Mana recalls some essays at colonisation, which were carried on with great vigour and perseverance. The enterprise was undertaken by a religious sister, Madame Javouhey, with a rare display of determination almost independently of Government control, although aided by the officials. With the help of the sisters of the community, of numerous hired labourers, and several hundred slaves, she founded various establishments, plantations, asylums, schools, a general hospital, and a lazaretto. The present village of Mana is regarded as one of the most salubrious in Guiana, and was formerly the "rice granary" of the whole colony.

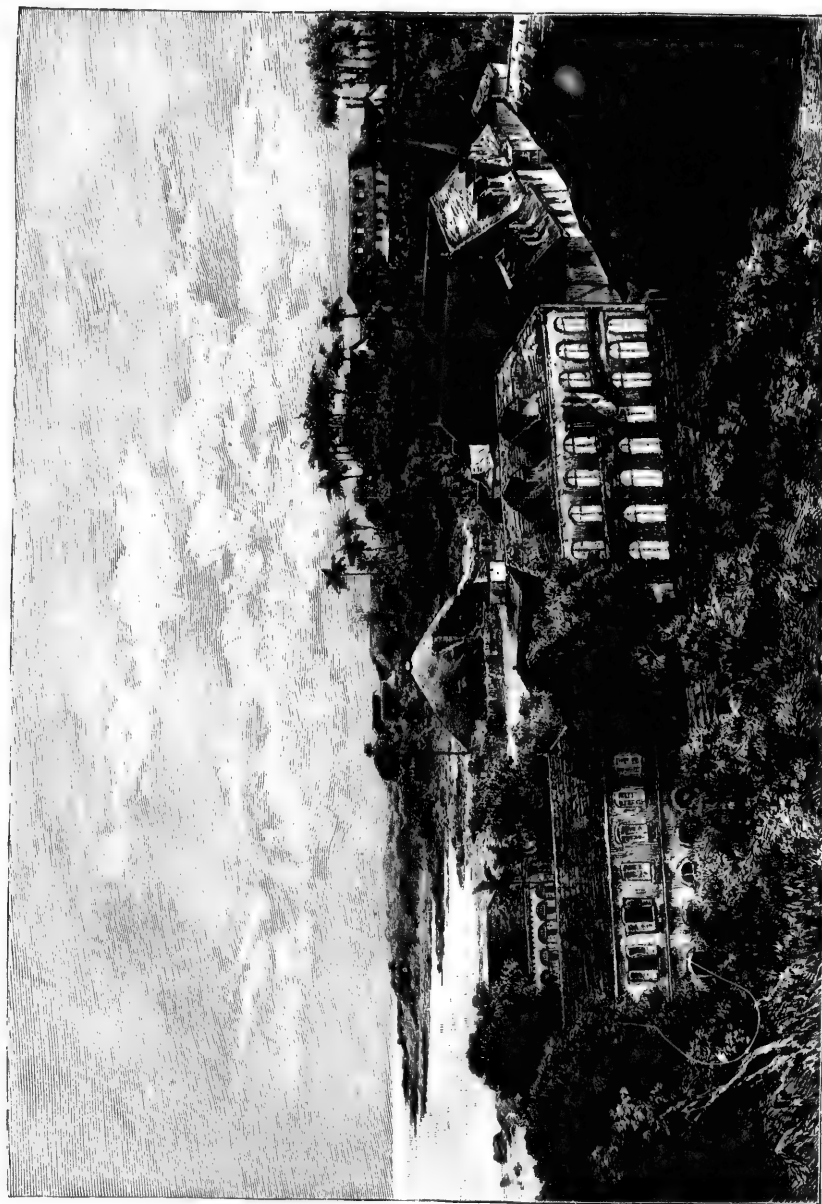
SINNAMARI—KOUROU.

Sinnamari, originally a Dutch settlement, founded near the mouth of the river of like name, has become famous as a place of banishment. In 1797 and 1798, after the Royalist conspiracy of Fructidor, over five hundred suspected were transported to this place; of the 329 landed by the *Charente*, 171, more than half, rapidly succumbed to their hardships, despair, and disease. But far more disastrous had been the attempt made to colonise the district in 1763, when about 13,000 emigrants from Alsace, Lorraine, and Saintonge were landed on the banks of the Kourou, some thirty miles east of the Sinnamari.

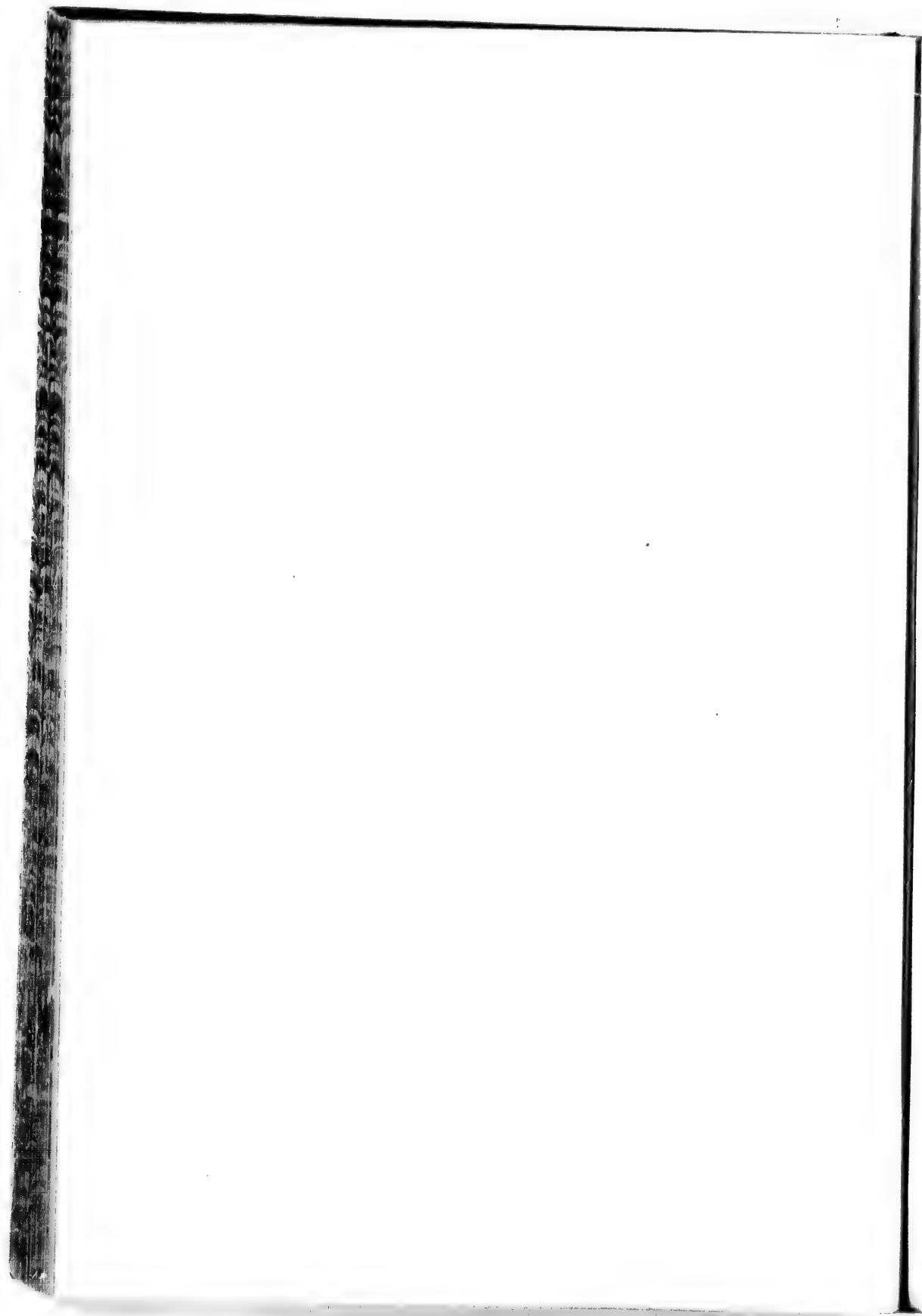
France had just ceded Canada to England, and Choiseul, who with his cousin, de Praslin, at that time ruled the Monarchy, decided to replace the lost territory by calling Guiana "Equatorial France," and despatching thither fleet after fleet of colonists. Even some players were included for the purpose of amusing the future "Guianese" in their hours of relaxation. In memory of Canada they were provided with skates, but the provisions were forgotten, and no arrangements were made for landing and housing the settlers, while the Chevalier de Turgot, who had been appointed leader of the expedition, remained in France. Even during the voyage the unhappy victims were decimated by the plague, and on the banks of the Kourou famine carried off those spared by typhus. After at least 10,000 had perished miserably, a few hundred survivors at last succeeded in getting back to Saint-Jean d'Angely, the port from which they had sailed.* A coffee plantation belonging to the Government marks the spot where most of the "colonists" had succumbed to their miseries. A few critical remarks on the colonising genius of the promoters of this scheme cost Fréron six months in the Bastille.

Farther east the district about the Kourou estuary was also the scene of some colonising experiments. At present some convicts are engaged on the plantations; but the *Kourou* penitentiary is a mere dependency of the three *Salut Islands* belonging to the neighbouring penal establishment. *Saint-Joseph* and the *Ile Royale* form the convict station proper, reserved for dangerous subjects, or for

* J. Mourié, *la Guyane française*.



CAYENNE—VIEW TAKEN FROM CÉPEROU.



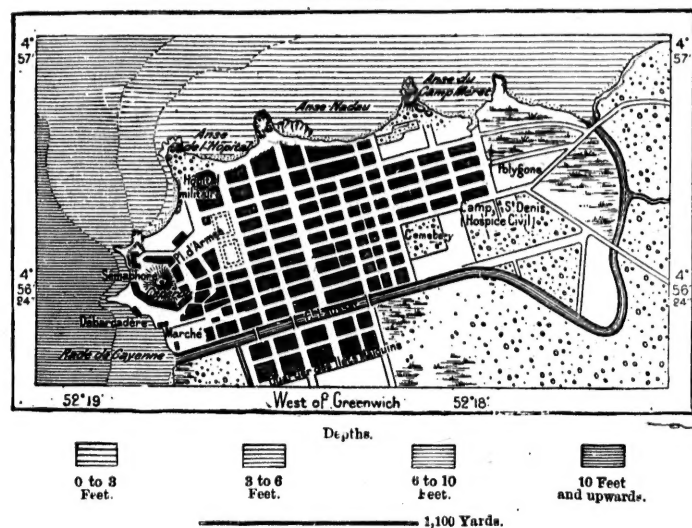
settled at the foot of the Remire Hills some distance to the east of the present town, which was founded at the little fort of *Saint-Louis*, but did not become the permanent capital of French Guiana till the year 1877.

Cayenne is comparatively speaking a large place, containing 10,000 inhabitants, or about one-third of the whole population of the colony. It is laid out in the usual American chessboard fashion, with streets at right angles and shady squares on a peninsular space at the foot of the verdant Céperou eminence at the north-west extremity of the island.

The administrative and Government buildings, hotels, barracks, and prisons occupy a large part of the town, which is encircled by parks and magnificent avenues of palm-trees. Being well exposed to the seabreeze, Cayenne would

Fig. 20.—CAYENNE.

Scale 1 : 30,000.



naturally enjoy a healthy climate but for the canals in the environs, which often get choked. A supply of water is brought by conduits from a neighbouring height fed by the Rorota rivulet. By far the greater part of the population consists of negroes, chiefly descendants of the freedmen who flocked to the place after the emancipation of 1848. But all the other races of the colony have their representatives in Cayenne. Most of the domestic servants are Creoles from Martinique; the booths and stores are chiefly in the hands of Chinese hucksters, while the fish markets are supplied by natives of Annam. The harbour is accessible to vessels drawing 14 feet, but it is partly exposed, and the shipping has occasionally been wrecked by high tides occurring in rough weather. A lighthouse has been erected on the *Enfant Perdu*, a rock at the northern entrance.

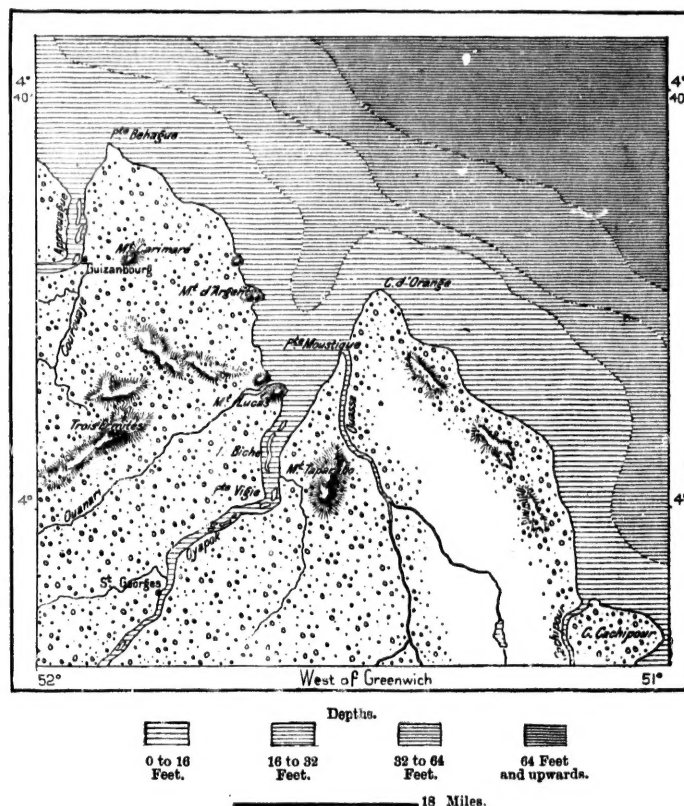
Formerly gardens and plantations abounded in the environs of Cayenne,

especially along the canals and in the eastern parts of the island. The Jesuits possessed rich coffee plantations at the foot of the Remire hill, and *Gabrielle*, on the mainland south-east of the capital, was even at one time famous for its spices. During the first years of the Restoration the cloves of this estate yielded a revenue of £16,000 in favourable years.

But at present all the old cultivated tracts have reverted to the state of bush, and nothing is now seen except here and there a few coffee and cacao shrubs run

Fig. 21.—MOUTH OF THE OYAPOK.

Scale 1 : 1,100,000.



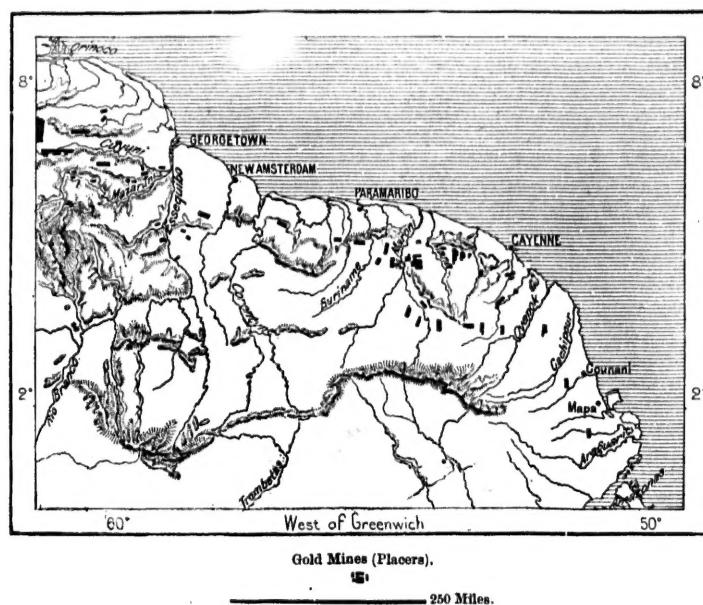
wild. The island is traversed by some carriage roads, one of which, 11 miles long, runs to the so-called *Dégrad des Canes*, a landing stage for the little steamer which plies on the Mahuri creek as far as the village of *Roura*. Farther on, that is, always to the windward of Cayenne, flows the *Kaw* river with a settlement of the same name, beyond which follows the *Approuague*, famous for its auriferous alluvia. It was in the valley of the *Aratai*, a western affluent of the *Approuague*, that gold was first discovered in this basin by a

Brazilian named Paulino in the year 1855. Since then both the Approuague and the Upper Maroni goldfields have yielded a continuous supply of the precious metal to the miners.

On the coast between the Approuague and Oyapok estuaries the so-called *Montagne d'Argent* ("Silver Mountain"), a little eminence 264 feet high, also recalls some old mining operations. Here an unhealthy penal settlement, which had to be abandoned, has been replaced by a coffee plantation. The *Montagne d'Argent* serves as a landmark to pilots making for the mouth of the Oyapok, present easterly limit of French Guiana. There are scarcely any settlements in the valley of this copious river, which has been thoroughly but unsuccessfully

Fig. 22.—GOLD MINES OF GUIANA.

Scale 1 : 13,000,000.



explored by prospectors. Nothing was found except a few particles along the banks of the stream.

NATURAL RESOURCES.—TRADE.

In French Guiana are found all the products of the tropical zone, but none in sufficient abundance to support a large export trade. In 1890, after half a century of agricultural decline, not more than 9,400 acres were under cultivation in the whole colony, and of these fully two-thirds were devoted to the production of provisions for the local consumption. Sugar, coffee, and cacao represent altogether a total annual crop of not more than 100 tons. The so-called *hattes* or *ménageries* (cattle farms, farmsteads), contain very few cattle, and in 1890 the

whole colony possessed only 218 weedy, badly-bred horses. Of horned cattle, which succeed best, there were over 6,000, and about the same number of pigs, besides those running wild in the woods. A few hundred sheep, goats, asses, and mules complete the list of livestock.

The industries, properly so-called, are in a rudimentary state, being limited to a few *tafia* (coarse rum) distilleries, some saw-mills, and other small establishments. The largest industrial operations are those connected with auriferous quartz-crushing. But the yield of gold has gradually fallen off since 1875. In that year the registered return rose to about 4,500 pounds, valued at £227,000, to which, perhaps, half as much more should be added for the pilferings at the works and for the gold smuggled abroad. The iron ores, which abound in some districts, have never been worked.

Despite certain statements to the contrary, the trade of French Guiana is certainly greater at present than it was before the Revolution. The yearly exchanges with the rest of the world average from £520,000 to £720,000. The imports greatly exceed the exports, most of the merchandise brought into the colony being destined for the convict stations and the garrisons, which produce nothing in return. At present the whole of the shipping falls below 100,000 tons, but it is steadily increasing, thanks to the greater facilities of communication enjoyed by steamers over sailing vessels. Cayenne is connected by a regular line of steamships with Martinique and France by the Surinam and Demerara route. Small steamers ply on the coast, and a telegraph line 200 miles long connects Cayenne with the Maroni.

ADMINISTRATION.

Although French Guiana possesses a general council of 16 elected members, of whom seven for Cayenne, and also nominates a deputy to the French Chambers, the population is too small and the army of officials too strongly organised for the absolute power of the governor to be checked by this initial measure of local representation. Under the direct orders of the governor are the military commander, the heads of the naval forces and of the marine, the director of the interior, the procurator-general, the head of the penitentiary department. All these functionaries constitute his privy council, to which, as a matter of form, are added three of the inhabitants whom he chooses, and whose vote he can always depend upon.

But even were the whole council in opposition, the governor might still defy them, and even manipulate the annual budget, not to say expel any refractory members. Except during the elections, the *Moniteur Officiel*, issued weekly, is the only journal in the Colony. In a word, the penitentiary system of administration may be said to mould civil society itself.

After the Coup d'Etat of 1851, the transportation system was introduced by special decree, and is now the sole motive for the maintenance of French rule in Guiana. The first convoy of condemned criminals arrived at the Salut Islands in 1852, and by the year 1867 over 18,000 had been despatched to the various